The Builder.

No. CLXXXIII.

SATURDAY, AUGUST 8, 1846.

GLOUCESTER, the *fair city* of the British, as some say (Caer Glow), was well chosen as a meeting-place by the British Archæological Association. It stands on a Roman basis, it possesses a noble cathedral, several interesting churches, and has many places in the neighbourhood, as Tewkesbury, Cirencester, Goodrich Castle and Court, Sudeley, Berkeley Castle, and others, with strong attractions for the antiquary and architect. Beyond these, however, the subject of archæology has been much neglected in Gloucester, and many objects of great interest have been allowed to disappear without any efforts for their preservation being made. To induce an interest in the subject, to shew the value of vestiges of antiquity in connection with history, and lead to a proper study of them, are the purposes of such societies; and therefore it is, we say, that Gloucester was well chosen for this congress. The enlightened study of antiquities has been productive of the greatest advantages, and will be more so. We are thereby arriving at a truer knowledge of our forefathers and their times, and are under the greatest obligations to those who, in the face of ridicule, have assisted to preserve ruined buildings, half effaced inscriptions, "unreadable" parchments, and broken pottery. To lead to the conservation of ancient monuments, a knowledge of their value must be spread abroad, and this the provincial visits of the Archæological Association, and the Institute, cannot fail to effect.

The latter body met a few weeks ago at York, and we laid before our readers abstracts of such of the papers read as were likely to interest them. Being unluckily prevented from attending there, no mention was made of the general proceedings, and as we are about to speak at some length of those at Gloucester, we cannot refrain from alluding to the omission, to prevent the charge of partizanship, which up to this we have successfully avoided. Our opinion of the disagreement is known to the readers of THE BUILDER. We regret the division that took place, and hope one day to see a junction effected; but while they are working separately will give both all the aid in our power, with a view to the successful prosecution of their useful purpose.

To return then to the British Archæological Association at Gloucester:—

On Monday, at three o'clock, a General Meeting was held at the Shire Hall, when Mr. Pettigrew, vice-president, in the absence of Lord Albert Conyngham, through illness, reviewed, ably, the doings of the association since its establishment.

Mr. Pettigrew said justly, that the ridicule which formerly attached to the pursuits of antiquaries no longer existed: "a proper view of their importance is entertained, and their connection with history forms now the primary and proper object of their application. The importance to carry out such extended objects, for the illustration of which much and varied knowledge is demanded, has been strikingly shewn in the labours of this association, which yet can claim only an existence of scarcely three years." He mentioning the ancient structures preserved by the interference of the association, the chairman dwelt particularly on the efforts made to save Caistor Castle, and the success which attended them; because, he said, the merit of it had been claimed for the Archæological Institute.

Mr. Roach Smith, honorary secretary, read a notice, by Mr. T. Inskipp, of a tesselated Roman pavement, discovered in Gloucester in 1844, and hitherto unpublished. Mr. Inskipp was passing accidentally through the city at the moment it was found, and made a drawing of it before it was destroyed.

Mr. Farmer Dukes, F.S.A., submitted an account of the ancient baronial mansion of Plaish, Salop, built in the 16th century. It was stated that the owner, a judge, inquired, at the time he was building it, for an artisan who could execute the ornamental chimney-shafts, and was told that he had himself just condemned to death the only man in the neighbourhood who could construct them. Then, said the judge, he shall do my chimneys first. And accordingly the cunning workman was respited *pro tem.*, executed the chimneys, and was then hung.

The members dined together at the Bell Inn, but our notice must not extend to matters social. At the evening meeting, which was numerously attended, an interesting paper on

THE NEW INN AT GLOUCESTER, AND ANCIENT HOSTELS,

by Mr. Britton, was read by Mr. Godwin.

We make the following extracts in the writer's own words:—

"It is to me a source of great gratification to hail the present meeting. I exult in having lived to see an epoch calculated to exalt and popularize the study of *Archæology*. I use the term *popularize* from a comparison and contrast between the state of archæology and antiquarian literature *now*, and at the beginning of the present century, when I first entered upon its study and practice. At that time an antiquary was regarded as a dull, plodding, abstracted, and eccentric being, ridiculed by the satirist and dramatist, and separated from men of general science and general literature. Now we have had, and still have, not only many profound scholars amongst its distinguished votaries, but men of varied and preeminent talents. I could exemplify this assertion by reference to names which command the respect of all classes of society. Amongst those who no longer remain to us, were Sir Walter Scott, the Whitakers of Cornwall and of Yorkshire, Daniel and Samuel Lysons, Mr. Surtees, Sir Henry Englefield, Mr. Hamper, and many others whose talents and writings have conferred honour on English literature.

Struggling and groping as I did in the early part of my literary career, I view with astonishment and delight, the rapid progress which has been lately made in topographical and antiquarian literature. Formerly there were but few authors, few draftsmen, and few engravers, qualified to elucidate or illustrate, with skill or taste, the many and varied subjects belonging to this branch of learning. *Now*, if their amount could be stated in round numbers, it would astonish the ordinary observer. This may be easily inferred from a review of the many publications which have recently issued from the press, and from the works of numerous amateur artists and authors which are limited to friendly circles. I have watched with anxiety and interest the growth of this taste,—the budding and blossoming of this rare fruit in the garden of England, and feel assured that the Archæological Association will eminently tend to nurture and bring to ripeness many useful specimens.

Change, reformation, revolution, is inherent in all mundane things. The seasons present an endless succession of changes, and all terrestrial and celestial objects move onward, and revolve; thereby exhibiting new phases and aspects for the study and admiration of man. So even all the works of man himself undergo mutations, from perfection, or completeness, to ruin and annihilation. Hence we are induced to view with curiosity and interest the handicraft and artistic productions of former generations as evidences of the manners, customs, and intellectual qualities of their producers; and to endeavour to deduce history from buildings, statues, coins, domestic utensils, and indeed from every variety of implement or ornament. This is the province of the archæologist. In the architectural ruins of Egypt, Greece, and Italy, we see and estimate the character and condition of mankind in times and countries far removed from our own; and in such reviews we acquire wisdom and find pleasure.

The *dark ages* and *enlightened ages* are terms of comparative import and meaning. We of the present day are arrogant enough to fancy that we live in the latter, and that our ancestors groped in mental darkness during the former. What are called the *middle ages* certainly exhibit a very useful contrast to the present, as well as to those of the Grecian, the Roman, and the later Egyptian dynasties. From archæological evidence—perhaps a better and more authentic source than even literary records of ancient history—we know that in the useful and ornamental arts the Egyptians were far advanced, both in knowledge and in practice. By the Greeks all these were further improved, and more adapted to the desires and the necessities of a refined and luxurious people. But in the *middle ages*,—from the dominion of the Saxons in Britain to the advent of the Tudor family,—we do not find much elegance, grace, or beauty, except in *one*, and that the noblest of the arts. *Architecture* was even in those ages diligently studied, and hundreds, nay, thousands of churches were erected, which are calculated to excite our utmost admiration and surprise.

It is not, however, with the great masterpieces of the freemasons of those olden times that we have now to deal. Our present object is merely to direct attention,—by some general remarks upon a class of interesting old buildings,—the *ancient inns* or *hostelries of England*,—to one of the most curious specimens of that class now remaining,—the "New Inn," in the city of Gloucester, as it is still somewhat inconsistently termed.

The peculiar comforts of the inn or tavern have possessed a charm for Englishmen, from the days of Chaucer, when Canterbury pilgrims made them places of halting and refreshment, to the time of Shakspere (whose "Falstaff" indignantly exclaims, "Shall I not take mine ease in mine inn?") and again to the time of Dr. Johnson, who declared a "tavern chair" to be "the throne of earthly felicity."

The "New Inn" at Gloucester was itself erected about half a century after Chaucer's death, and probably supplied the place of one much older.

PILGRIMAGES, which Aubrey, as well as Chaucer, mentions, were greatly conducive to increasing the number and importance of *Inns*.

The priory of Lewes in Sussex, had a hostelry in the parish of St. Olave's, Southwark, where the fraternity were themselves lodged, and where they dispensed their hospitality when they visited London. It afterwards became a public inn, known as the Walnut Tree, and in forming the approaches to New London Bridge, some remains of the building (a crypt of Norman character), were discovered.*

Many old inns may be still met with between London and Canterbury;—at Dartford especially.

The *George*, at Glastonbury, is a well known ancient pilgrims' inn, and remarkable for its fine architectural exterior elevation.

A curious ancient inn at the corner of Spicer-street, St. Alban's, is illustrated (from a drawing by Buckler), in *Gentleman's Magazine*—(September 1845).

The *Angel*, at Grantham; the *Red Lion*, at Corsham, &c., are more or less curious and interesting.—In plan and arrangement, these buildings were all similar to each other.

It is a recorded fact, that the "New Inn" was built by John Twining, a monk of Gloucester, during the abbacy of Thomas Seabrooke, who presided over the monastery there from 1450 till his death in 1457; and it is still the property of the dean and chapter of the present cathedral establishment.

There can be very little doubt that this inn

* See "Brayley's Graphic Illustrations."

was built for the accommodation of the great concourse of pilgrims and devotees who were attracted to the abbey church, by its peculiar sanctity, as the place where the remains of the murdered monarch, Edward the Second, had been interred, more than a century previously.

It is recorded of Edward the Second that, coming to Gloucester about the year 1319, he was honourably received by Abbot Thokey and the Convent; and, being present at an entertainment given in the Abbot's Hall, observed the pictures of his predecessors, and jocosely inquired if his own was among them. The abbot, in something of a prophetic spirit, answered, that he hoped he should have him in a more honourable place. This actually occurred; for, when the king was murdered, the monasteries of Bristol, Kingswood, and Malmesbury refused to receive the royal corpse, through fear of Mortimer and the queen; but Abbot Thokey brought the dead body from Berkeley Castle in his own carriage to the monastery of Gloucester, where it was received by the members of the convent in procession, and buried on the north side of the choir, near the great altar.†

The writer then gave some particulars of the death of the king, and shewed the advantages which resulted to the monastery from the burial of the king. Funds flowed in and enabled the abbots to execute great works.

The following passage from Archdeacon Furney's MSS. shews that this inn belonged entirely to the Abbey:—

"In or about Abbot Seabroke's time (1450—1457), John Twynning, then called a laudable man, and a monk of this abbey, built from the foundation the *Great Inn*, called the New Inn, in the upper Northgate-street, to the great profit and advantage of the abbey, which, according to tradition, was intended for the reception of pilgrims."

The building was spacious in extent, and constructed of ponderous and durable materials. The different apartments surrounded two square courts, and, as indicated by present appearances, were provided with stairs, which ascended from the courts and communicated with two tiers of galleries. These led to numerous large and small dormitories, or sleeping rooms. The building is commonly said to be constructed entirely of chesnut-tree timber. Almost half of its material is wood, cut into large beams, and placed horizontally, perpendicularly, and diagonally, with the intermediate parts filled either with brick-nogging or lath and plaster. The whole building extends 137 feet from east to west, exclusive of the stables, &c., which continue 72 feet further. The court yard seems admirably adapted for Chaucer's Canterbury Pilgrims, and Shakspere's carriers, in the play of Henry IV.

The paper was illustrated by some excellent diagrams, and Mr. Britton, at the close, added some remarks on timber houses generally, of which there are many good specimens in Gloucester.

Mr. Godwin pointed the attention of those who were now in Gloucester for the first time, to a part of the, so called, *New* Inn which had not been modernised,—the flank in New Inn-lane, which exhibits some good carving of the fifteenth century. Relative to the face of the upper stories of timber, each projecting before the other, although not wise in a sanatory point of view, he said it was in a constructional one, as the woodwork was thus protected.

Mr. Jerdan, with reference to the size and expenses of the ancient Inns said, "in Scotland Acts of Parliament were passed, with a view to their protection, preventing the exercise of private hospitality."

A paper on Monkish miracles, as illustrative of history, by Mr. Thomas Wright, M.A., followed; and then a number of small articles of the Roman period, discovered near Gloucester, were exhibited by Mr. Purnell. These included a *letter* padlock, supposed to be a modern invention.

† Britton's "Gloucester Cathedral," p. 20.

A paper by Mr. Pretty, of Northampton (read by Mr. C. Baily, F.S.A.), on a curious enamel on the poor's-box in Smarden Church, Kent, with a notice of the structure, concluded the business of the evening. We confine ourselves to the latter part of it.

SMARDEN CHURCH.

This church is popularly known as "The Barn of Kent." Hasted's description of this building is extremely scanty; he states, that the church is dedicated to Saint Michael, consists of one aisle or body, and a chancel; the former is of a most curious structure, being 40 feet wide, with a span roof over it, and singularly constructed. At the west end, is a tower steeple, with a beacon turret. He might have added a north and south porch to the account. Until within the last half century, the roof was open to the timbering, giving it probably an appearance congenial to the local term. Previous to the introduction of the chancel arch, when the church was ceiled, the building must have appeared in perspective from west to east as one gigantic lengthened roof, no break excepting that of the rood loft being perceptible to the eye. In the chancel, near the south buttress, there is a small narrow window closed up, which appears to have opened into the interior near the right of the altar at a very unusual place. In the usual position there is a piscina, cinque-foil headed, with bowl quite perfect, a credence-shelf, and above a smaller one of wood. Opposite, on the north side, there are appearances of the arch of the Aumbry-locker. There are three sedilia, the higher arch cinque-foiled, and the other two tre-foiled: the seat is of oak. To the right is a circular bracket, with a corresponding one on the north side. There are two windows on the north and two on the south sides, of two light tre-foiled and a broad quatre-foiled opening in the head; and at the east end there is a window three light cinque-foiled, with quatre-foiled and side piercing above. Over this window, on the exterior, under the gable point, is a stone with a cross pierced through, and which, before the ceiling was added, must have been seen from the interior. The arch which divides the chancel from the nave, as before observed, is modern, as is evident by the position of the lower part of the rood-loft screen, which is left extending considerably beyond; as well as by the appearance of the brick work behind the panelling of the pew on the left side. At the east end of the nave, on each side, there is a reredos, embattled at the top, and ornamented with a double corbel table, trefoil headed. On the right, or south side, there are the steps in the rood-loft tower, and opening internally above the door. Three decorated windows, similar to those in the chancel, of two lights, originally gave light on each side of the nave; but one on the north, near the altar, and two on the south side, have been since enlarged to three light perpendicular windows, to give additional light to this part of the church: probably done at the time the tower was built. The pulpit was originally placed on the north side, between the windows, to the right of the north door.

The tower of this church is of perpendicular architecture, of three stages, bold and lofty in design. It was entered from the nave by a noble perpendicular arch, now closed up by the erection of a gallery, theatrical in fashion, reaching by a series of pews to the ground. Before this addition was made, this part of the church must have been enlightened by the west window of three lights over the door in the belfry, as frequently occurs in the perpendicular towers of this neighbourhood. The staircase, or beacon turret, is at the north-east corner of the tower.

	ft.	in.
Length of chancel:—		
Within the altar-step	14	3
To chancel arch	26	0
From chancel arch to 1st step in the nave	6	3
Nave	70	0
	116	6
Width of chancel	18	2
Ditto, nave, from wall to wall	35	4

Tower, 18 feet by 13, exclusive of 3 ft. 6 in. in the tower arch.

Hasted's admeasurement was probably to the recessed part at the windows.

It is worthy of remark, that the walls are very thick in the piers between windows, by which the roof is ably sustained without any buttresses; those set on at the corners of the nave and chancel diagonally are merely for ornament.

On Tuesday, a large accession of members arrived, and at eleven o'clock the room in which the meetings were held was crowded to hear a paper on the cathedral, by Mr. Cresy—the result of a very careful examination of the building for this purpose. Mr. Monckton Milnes, M.P., was in the chair. Mr. Cresy sought to prove, in opposition to the general opinion, that a great part of the existing structure is anterior to the Norman conquest, and supported his views with great ability. We are unable to assent at once to his opinion. The paper, however, was one of so much interest, as to demand a more lengthened notice than we could now give it: we therefore postpone it till next week, when it will appear at some length. At the close of it, a discussion ensued, in which a number of members took part, and Mr. Niblett, the honorary secretary of the Gloucestershire Archæological Society, laid before the meeting a transcript of Abbott Frowcester's chronicles, connected with the abbey, made by himself. Mr. Niblett mentioned that a copy of the chronicles, which belonged to the chapter-room of Gloucester Cathedral, was missing, and justly urged that search should immediately be made for it. The meeting then adjourned to the cathedral, under the guidance of Mr. Cresy and Mr. Britton, and minutely examined the whole fabric. A more interesting cathedral can scarcely be found; it offers examples of every period, and presents a series of most instructive lessons to the architect who knows how to observe.

From the cathedral, a number of members proceeded to examine, amongst other edifices, the church of St. Mary de Crypt, recently restored through the exertions of the Rev. A. Sayers, the rector, and now the most interesting object in the city, after the cathedral. Of this, we shall speak more at length hereafter.

Relative to the dinner which followed, we will mention that Mr. Guise, the chairman of the Gloucestershire Archæological Society, addressed the members, merely that we may record the fact that this gentlemen has munificently presented to the city of Gloucester a very valuable collection of objects of natural history, as the foundation of a museum; and that the corporation have determined on the erection of a proper building to receive them.

At half-past eight in the evening, the members again met, Mr. Monckton Milnes in the chair, and a paper was read on the form of arches, illustrated by reference to Gloucester Cathedral, by Mr. John Adey Repton, an abstract of which we shall give. In connection with this, Mr. Godwin expressed a desire to draw the attention of the authorities to the present state of the cathedral. He said he ventured upon it with considerable hesitation, because it might be said that the association had no right to come into a city where they were kindly received, and find fault. It seemed to him, however, so important that the building should be immediately placed under the supervision of an architect, that he threw aside personal scruples, and made this public appeal to the Chapter in behalf of all who were interested in the preservation of our ancient buildings, and he hoped it would be received in the spirit in which it was offered.

An interesting discussion followed, on some points in Mr. Cresy's paper, in which Mr. A. White dissented from his views.

Mr. Wright made some observations on the

carvings under the misereres in the choir, and shewed that they all related to the current literature of the day. After this papers were read by Mr. Pettigrew "On the Gloucester Peg Tankard," and Mr. J. O. Halliwell "On Robert of Gloucester."

Wednesday was devoted to the examination of the beautiful Roman pavements at Woodchester, opened for the occasion, and the antiquities of Cirencester,—a meeting being afterwards held in the evening. On Thursday Tewkesbury and Cheltenham, with an evening meeting at the latter place, produced much interesting matter, to be noted with Cirencester in our next. In the meantime we give a view of the Abbot's gate and the Abbey Church at Tewkesbury.*

THE ARCHITECTURE OF PISA.

THE CATHEDRAL AND ITS HISTORY.†

The successful results of commerce, which filled the maritime cities of Venice and Genoa with wealth, and their streets with magnificent structures, and which called into exercise the talents of the Florentine architects, produced similar results in the ancient city of Pisa. When the Italian cities of the north declared their independence, Pisa was actuated by the same spirit, and formed itself into a republic. It rose early into importance. In the tenth century it was rich and powerful; its fleets triumphed at sea, and its commerce was extended to the limits of the Mediterranean. Its prosperity lasted during the 11th, 12th, and 13th centuries. Corsica, Sardinia, and the Balearic islands were obliged to submit to its power, and its alliance was courted by the emperor, and the pontiff. The Saracens on the coasts of Africa and Sicily were vanquished by its arms, and the Christians in Palestine owed their safety to its prowess. During this period its streets were adorned with palaces, and its churches were rebuilt in a style of magnificence, for which they may have been in part indebted to the marbles, which the Pisan galleys brought as spoils of conquest. But the history of Italian cities, unless it enters minutely into particulars, has to use the same recital in the one case, as in the preceding. First, civil dissension; next, the usurpation of power by an oligarchy, and the real republic ceases to exist. Pisa, vanquished by the Genoese, and deceived by France, at length fell into the hands of the Medici, who subjected it to its rival, Florence, about the year 1228.

But, it is with the influence of Pisa in art, that we have here the most concern. Its most important buildings were erected at a time, when art in Italy had scarcely a recognized existence; and their origin forms one of the most interesting inquiries in the study of architectural history. Still it is far from being decided, whether the style of the Duomo, or Cathedral of Pisa, should be classed as the offspring of the Debased Roman, or of the Byzantine, or Greek. It is an inquiry, which calls for a complete knowledge of the various styles, which existed in Italy at the same period, but is one of great importance, from the influence which the Pisan structure had upon succeeding churches. The evidence of an inscription has been put forward, on one side, to prove that the architect was a Greek, whilst on the other, the plan is clearly the Latin cross. If we say with Mr. Gally Knight,‡ that the opinion that Busketus was a Greek "does not appear to rest on any solid grounds," and that "the best proof of the contrary is to be found in the Duomo itself," we find ourselves opposed to Mr. Gwilt, and to Messrs. Cresy and Taylor. On the one hand, it seems difficult to dispute the statement in the inscription; whilst on the other, as architects, we cannot but consider the absence of the Greek plan, and of other features not observable in Romanesque, as evidence equally convincing. Mr. Gwilt states, that the four buildings at Pisa are "strongly marked with the distinguishing features of the Byzantine and Romanesque styles." D'Agincourt, in his great work on the "History of Art," reviewed in the last volume of The Builder, is of opinion that the cathedral was formed directly upon the model of the Greek churches; whilst the writer in the *Quarterly Review* (March, 1845), says that the style of Pisa Cathedral was formed upon that of the Roman Christian Basilica. The impression conveyed by the review to most readers would be, that a distinction was intended between the style of the Basilica and that called Romanesque. Mr. Murray, whose general accuracy justifies a reference, which we should not make to an ordinary guide book, sums up the question in concise terms; and those who read the different opinions, will probably arrive at the same conclusion.* It seems, that for a long period, the meaning of the epitaph has been misconstrued, whilst the confidence of the same party in the dispute has been strengthened by a tradition, that the architect had been sent from Constantinople. On the other side it has been maintained, that the architect was not only an Italian, but a native of the city. The Greco-Italians have called him *Bouskeptos*, whilst the patriots see clearly that *Busketus* is merely the Latinized form of *Boschetto*. Such being the state of the question amongst the learned, an opinion may very fairly be taken upon the building, which we should be inclined to regard not as a Byzantine, but as a "Romanesque" work. The classification of buildings, and the nomenclature of styles in Italy is, however, attended with greater difficulties than in any other country, which results from the general resemblance, necessarily existing between different dates, and styles of architecture, all derived from the one type of Roman architecture.

In the middle of the eleventh century commercial enterprise, and naval exploits had raised the city of Pisa to a remarkable height of prosperity. In 1063, assisting the Normans in Sicily against the Saracens, the Pisans attacked Palermo with their fleet, entered the harbour, and returned to their city with several of the enemy's ships. On this event, they resolved to erect a cathedral, partly as a memorial of their success. The first stone was laid in 1064, and the building completed in 1118. The general plan develops the form of the Latin cross, perhaps more completely than in any other cathedral in Italy. The nave and choir have two aisles, and the transepts one aisle, on each side. The plan is of that kind, called by Professor Willis "transverse triapsal," that is to say, it has an apse at each end of the transepts, and one at the end of the choir. The length from the inner face of the wall to the back of the recess is 311 feet, the width of the nave and four aisles is 106 feet 6 inches, the length of the transepts is 237 feet 4 inches, and the width of the transept and aisles is 58 feet. The nave in the centre is 42 feet wide. Exclusive of the piers of the dome, there are twelve Corinthian columns, in the length of the church, on each side; they are all of granite. These columns are 24 feet 10 inches high, of a single block with Corinthian capitals. They bear arches, springing immediately from the capitals; over these is a cornice. Above is a triforium, having arches with a central column and subarches, as in the Norman style; and there are small clerestory windows. The ceiling is flat, of wood, panelled, and enriched with gilding. The total height is about 90 feet. The roofs of the aisles are groined. The building is enriched with painting and sculpture, and the windows are glazed with stained glass, and the whole effect of the interior is magnificent. A peculiar character is given to the building by the use of different coloured marbles in courses, a style, which is thought to have been derived from Saracenic buildings. It seems to have been much practised in Tuscany, and was perhaps first introduced in Pisa. The arrangement is precisely similar to that found in the buildings of Kairo.

The space at the intersection of the cross is surmounted by a dome, which, though subsequent to those at Venice, and Ravenna, is supposed to have influenced the adoption of this feature in later examples. But the dome of the Pisa cathedral has the singular peculiarity of being oval in the plan. The pointed arches which support it, are said by Mr. Knight, to have been introduced after the fire, which destroyed the original cupola and roof, and which took place in 1596. This would be extending the use of the pointed style to a late date, and it seems more probable, that they were built at the same time as some other Gothic portions, which it is now agreed were not part of the original building. But it is much to be regretted, that we do not know the date of these arches, and of those to the aisles, which are also pointed, as it might be important in the question of chronology.—The vault of the apsis is filled with gigantic figures in mosaic. They were completed in 1320, and have been mentioned as examples of the retention of archaic forms, subsequent to a period of improvement. There are twelve altars in the nave and transepts, the designs of which have been attributed to Michael Angelo, apparently without much reason. There is much carving, of beautiful design and execution. There are also several statues, and ornamental works in bronze, which shew the skill of the Pisans and Florentines in the casting and fabricating of metals.*

The exterior of this cathedral has delighted every traveller by whom it has been described. Whether it be from the arrangement of its small columns, which are relieved from the wall, so as to produce the finest effects of light and shadow in continual variety, from the hues, which time and the sunshine of Italy impart to the chequered marble of the building, from the grouping of the cathedral with the Campanile, the Baptistery, and the Campo Santo, which are adjacent to it, from the solitude of these structures, rising from the green sward apart from the "hum of cities," or from the curious research into the meaning of inscriptions, which are found profusely upon the stones employed in the building, and which awaken more recollections of the potency of Time, than the clearest explanation could disclose; certain it is, that there are few buildings, which dwell so long upon the memory, and whose beauties the pencil so entirely fails to convey. *One* secret of the charm is perhaps to be discovered in those circumstances of position, which were lately noticed by a writer in this journal. They are not railed round, and, as Mr. Murray does not fail to observe, "the whole building stands upon a terrace ascended by steps, adding much to its majesty." The external decoration consists of ranges of columns and arches, which in the façade and apsis, stand at some distance in front of the wall. It seems, that originally the whole exterior was built of the horizontal bands of marble, but these terminate abruptly a short distance from the façade. There are, however, circles and patterns of coloured marble, red, green, &c., in various parts, and these are shewn in the work of Messrs. Cresy and Taylor. The same work, assuming the cathedral to be the work of a Greek architect, traces a resemblance to the polychromy of Athenian buildings; and it must at least be admitted, that Grecian artists were at one time much employed by the Italians, and that the Pisans were in constant intercourse with the Morea. The termination of the dome is very unsightly, but the gothic canopies, which encircle the tambour, have a very beautiful effect. There are no other parts which interfere with the general unity. In a paper in the *Archæologia*, vol. xv., by Mr. R. Smirke, jun., F.S.A., certain ornaments on the gable of the façade, called by him "crockets," and clearly coeval with the gable, were considered as gothic, that argument being used to prove, that the canopies of the dome were not of late date. Every succeeding inquiry has certainly proved the truth of the assertion, that one style did not so much characterize each particular era in Italy, as in England, but Mr. Arthur Taylor, who made a very careful examination, reported (*Archæologia*, vol. xx. 12), that the canopies were unquestionably additions, and that the "crockets" were quite destitute of any real gothic character.—The original doors were of bronze, with compartments illustrative of events in the Gospel. All these but one were destroyed by the fire, but were replaced by others, modelled by Giovanni di Bologna, in 1602. They are all represented in the "Theatrum Basilicæ

* See page 378.

† 1.—"Architecture of the Middle Ages in Italy; illustrated by views, plans, elevations, sections, and details, of the Cathedral, Baptistery, Leaning Tower or Campanile, and Campo Santo, at Pisa: from drawings and measurements taken in the year 1817, accompanied by descriptive accounts of their history and construction. By Edward Cresy, and G. L. Taylor, architects, and F.S.A. London, 1829."

2.—"Theatrum Basilicæ Pisanæ, in quo præcipuæ illius partes enarrationibus, iconibusque ostenduntur; cura et studio Josephi Martini, ejusdem basilicæ Canonici, J. C. et Nob. Pis. Editio Secunda. Romæ, MDCCXXVIII."

‡ "The Ecclesiastical Architecture of Italy, from the time of Constantine to the 16th century."

* "Handbook to Northern Italy."

* The bronze lamp, which is said to have first suggested to Galileo the theory of the pendulum, is still suspended in the nave. It is of fine workmanship.

Pisanæ," and are inferior only to those of the Baptistery at Florence. In the same work, also, is a drawing of a capital of great beauty; it has birds and grotesque heads amongst the acanthus leaves; there are figures of sportive children between the caulicoli, and the latter are supported by birds. The engraving is executed with care, which can hardly be said of others in the same book.

The cathedral of Pisa is not only in design, a structure in advance of the period of its erection, but is equally a remarkable work in construction. It appears that the architect excelled in mechanical contrivances; and inscriptions, distinct from his epitaph, record that he invented a machine, by which ten maidens could raise the load of a thousand oxen. Another inscription gives the name of Magister Rainaldus, and has led to the supposition that he was joint architect of the building. But it would be difficult to find any structure so clearly the work of one mind, and it is more probable that Rainaldus was the sculptor of the ornaments of the façade. Still, if there be any who think that Greek and Italian types are both discernible in the building, they may readily interpret both this inscription and the epitaph in the manner they wish.

The work of Messrs. Cresy and Taylor contains complete plans, some details, and other illustrations of the four buildings. The description has some ingenious speculations arising from the comparison of the Pisan buildings with those of other countries. The plates are well engraved, and the work is in this respect a very great advance upon the older one upon the list. The latter is, however, well worth examining, and must be consulted by every one who is inquiring into the history of these structures. It is in one volume folio, in Latin, and has a considerable number of illustrations. There is great difference in the manner of their execution. Some of them are curious attempts at perspective, not all of which it is easy to comprehend the intention of. The Baptistry, Campanile, and Campo Santo form part of the same volume.—The work of Morrona is still more valuable as a book of reference for the history of art in Pisa, but we must defer speaking of it, as well as the remainder of the buildings illustrated in these volumes, to another notice of the architecture of Pisa. E. H.

BOHN'S STANDARD LIBRARY.

Beckman's History of Inventions, Discoveries, and Origins. Translated by W. Johnston. Revised and enlarged. Bohn, York-street, Covent Garden: 1846.

The series of works which Mr. Bohn is presenting to the public under the title of his "Standard Library," are remarkable for their goodness and cheapness, even in this age of cheap, good books, and ought to command a large sale. To be able to obtain Roscoe's "Life and Pontificate of Leo X.," Schlegel's "Lectures on the Philosophy of History," Sismondi's "History of the Literature of the South of Europe," and Schlegel's "Lectures on Dramatic Literature," for a few shillings, is extraordinary enough, and to find them beautifully printed and bound, and ably edited, is even more so. Yet so it is, and much praise is due to the enterprising publisher in consequence.

Beckman's well-known work is to be completed in two volumes, revised by Dr. Francis and Dr. Griffith. The first is now before us, and contains an immense mass of recondite information, and pleasant light reading, suitable to all capacities. To give an idea of its style and matter, we make the following extracts from the chapter on

PAVING AND CLEANSING THE STREETS.

"Of modern cities, the oldest pavement is commonly ascribed to that of Paris; but it is certain that Cordova in Spain was paved so early as the middle of the ninth century, or about the year 850, by Abdorrahman II., the fourth Spanish caliph. This prince, who knew the value of the arts and sciences, and who favoured trade so much that abundance in his reign prevailed throughout the whole land, caused water to be conveyed into that city, which was then his capital, by leaden pipes, and ornamented it with a mosque and other elegant buildings.

The capital of France was not paved in the twelfth century; for Rigord, the physician and historian of Philip II., relates, that the king standing one day at a window of his palace, near the Seine, and observing that the carriages which passed threw up the dirt in such a manner that it produced a most offensive stench, his majesty resolved to remedy this intolerable nuisance by causing the streets to be paved; which was accordingly done, notwithstanding the heavy expense that had prevented his predecessors from introducing the same improvement. The orders for this purpose were issued by the government in the year 1184; and upon that occasion, as is said, the name of the city, which was then called Lutetia on account of its dirtiness, was changed to that of Paris. This service rendered to Paris by that sovereign, who first also caused the cathedral to be surrounded by a wall, is confirmed by various historians. Mezeray informs us, that Gerard de Poissy, then intendant of the finances, expended eleven thousand marks of silver in this undertaking. It appears that a certain income was allowed to the city for defraying the expenses; for in 1285, a hundred years after, when it was proposed that the pavement should be carried without the gate of St. Martin, the citizens excused themselves from the work, by saying that the funds assigned to them were not sufficient for that purpose. It is certain, that in the year 1641 the streets in many quarters of Paris were not paved.

It is very probable that other opulent cities, finding the benefit which the capital derived from this improvement, were induced to follow its example. At any rate we know that Dijon, which was then reckoned one of the most beautiful, had paved streets so early as the year 1391, to which Philip the Bold, Duke of Burgundy, the second husband of Margaret, heiress of Flanders and other parts of the Netherlands, contributed two thousand livres; and in 1424 paviors were employed in all the streets. Historians remark, that after this period, dangerous diseases, such as the dysentery, spotted fever and others, became less frequent in that city.

That the streets of London were not paved at the end of the eleventh century, is asserted by all historians. As a proof of this, they relate that in the year 1090, when the church of St. Mary-le-Bow, in Cheapside, was unroofed by a violent storm of wind, four pillars or beams, which were twenty-six feet in length, sunk so deep into the ground, that scarcely four feet of them appeared above the surface. The streets of London then, says Howel, were not paved, but consisted of soft earth. I can, however, find no account of the time when paving was first introduced. It appears that the pavement of this immense city became gradually extended as trade and opulence increased. Several of the principal streets, such as Holborn, which at present are in the middle of the city, were paved for the first time by royal command in the year 1417.* Others were paved under Henry VIII., some in the suburbs,† in 1544, others in 1571 and 1605, and the great market of Smithfield, where cattle are sold, was first paved in 1614."

"When a solid bottom had been given to streets, the cleansing of them, which, as the Roman prætors said, is a continual improvement, was then rendered possible. At Rome were appointed *tribuni rerum nitentium*, who had the care of cleansing the streets, markets, temples, baths, and other public places. Strict orders were given that no filth should be thrown into the river or streets; whoever transgressed against this prohibition was subjected to punishment, and obliged to repair the damage. The public sewers, *cloacæ*, under the streets contributed very much to facilitate the cleaning of them, yet they were commonly full of mud, as those of Paris are at present, notwithstanding the many expensive regulations established to prevent that nuisance.

A very improper liberty prevailed at Paris in the fourteenth century, which was, that all persons might throw any thing from their windows whenever they chose, provided they gave notice three times before, by crying out *Gare l'eau*, which is as much as to say, Take care of water. This privilege was forbidden in 1372, and still more severely in 1395. A like practice, however, seems to have continued longer at Edinburgh; for in the year 1750, when people went out into the streets at night, it was necessary, in order to avoid disagreeable accidents from the windows, that they should take with them a guide, who as he went along called out with a loud voice, in the Scotch dialect, *Haud your haunde*, stop your hand.*

This practice, however, would not have been suppressed at Paris, had not the police paid particular attention to promote the interior cleanliness of the houses, and the erection of privies. Some will perhaps be astonished that these conveniences should have been first introduced into the capital of France by an order from government in the sixteenth century; especially as they are at present considered to be so indispensably necessary, that few summer-houses are constructed without them. Those, however, to whom this affords matter of surprise must be still more astonished when they are told, that the residence of the King of Spain was destitute of this improvement at the very time that the English circumnavigators found privies, constructed in the European manner, near the habitations of the cannibals of New Zealand. But Madrid is not the royal residence which has had dirty streets longest on account of this want. Privies began to be erected at Warsaw for the first time only within these few years.

In the Parisian code of laws, *Coûtume de Paris*, which was improved and confirmed in 1513, it is expressly ordered, that every house should have a privy. This order, with the denunciation of severer punishment in case of disobedience, was renewed in 1533; and in 1538 the under officers of police were obliged to examine the houses and to report the names of those who had not complied with this beneficial regulation. It appears, however, that the order of 1533 was not the latest; for in 1697, and even in 1700, the police was under the necessity of strictly commanding "that people should construct privies in their houses, and repair those already constructed, and that within a month at furthest, under the penalty of being fined in case of neglect, and of having their houses shut up until they should be in a proper condition." This order is given in the same words in the Coûtume de Mante, Etampes, Nivernois, Bourbonnois, Calais, Tournay, and Melun. That issued at Bordeaux is of the year 1585.

Privies seem to have been common in the large and flourishing towns of Germany much earlier than in the capital of France; and those who are not disposed to find fault with me for introducing proofs here which historians have not disdained to record, may read what follows:—In the annals of Frankfort on the Maine, where mention is made of the cheapness of former times, we are told how much a citizen there gave in the year 1477 for cleaning his privy. We are informed also, that in 1496 an order was issued by the council forbidding the proprietors of houses situated in a certain place planted with trees to erect privies towards the side where the trees were growing; and that in 1498, George Pfeffer von Hell, J.U.D. and chancellor of the electorate of Mentz, fell by accident into a privy, and there perished. It appears, however, from the streets and houses of most of our cities, that they were constructed before such conveniences were thought of, and that these were erected through force at a later period."

[Berlin, strange to say, is very ill circumstanced in respect to these conveniences, even at the present day (1846). In most of the houses, small closets are located on the landings of the stairs, which require to be emptied every other night, to the no great satisfaction of the olfactory nerves. Nor are the streets kept in a very proper state,—large puddles of filth

* In the king's order it was said, that the highway named Holbourn in London was so deep and miry, that many perils and hazards were thereby occasioned as well to the king's carriages passing that way as to those of his subjects; he therefore ordained two vessels, each of twenty tons burthen, to be employed at his expense, for bringing stones for paving and mending the same.—Anderson's Hist. of Com., i., p. 244.

† In this order the streets were described "as very foul, and full of pits and sloughs, very perilous and (noyous) noisome, as well for the king's subjects on horseback as on foot, and with carriage."—Anderson, *ut supra*, p. 370.

* Letters from Scotland, 1760, 2 vols., 8vo. At this period, when the luxury of water-closets was unknown, it was a custom for men to perambulate the streets of Edinburgh, carrying conveniences (pails) suspended from a yoke on their shoulders, enveloped by cloaks sufficiently large to cover both their apparatus and customers, crying, "Who wants me, for a bawbee?" It has since been used against the Edinburgh people as a joke or satire upon an ancient custom. By way of a set-off, however, it may be observed that at the present day there is a water-closet in almost every house in Edinburgh.

being allowed to collect before the doors even of the best houses, and which, especially in the hot months of summer, diffuse a most horrible stench. Something, however, must be allowed for the low situation of the town, which renders drainage next to impracticable. Laing, in his Notes of a Traveller, speaking of Berlin as he found it in 1841, says, "It is a fine city, very like the age she represents—very fine and very nasty.....The streets are spacious and straight, with broad margins on each side for foot-passengers; and a band of plain flagstones on these margins make them much more walkable than the streets of most continental towns. But these margins are divided from the spacious carriage-way in the middle by open kennels, telling the nose unutterable things. These open kennels are boarded over only at the gateways of the palaces, to let the carriages cross them, and must be particularly convenient to the inhabitants, for they are not at all particularly agreeable. Use reconciles people to nuisances which might be easily removed. A sluggish but considerable river, the Spree, stagnates through the town, and the money laid out in stucco work and outside decoration of the houses, would go far towards covering over their drains, raising the water by engines and sending it in a purifying stream through every street and sewer. If bronze and marble could smell, Blucher and Bulow, Schwerin and Ziethen, and duck-winged angels, and two-headed eagles innumerable, would be found on their pedestals holding their noses instead of grasping their swords. It is a curious illustration of the difference between the civilization of the fine arts and that of the useful arts, in their influences on social well-being, that Berlin, as yet, has not advanced so far in the enjoyments and comforts of life, in the civilization of the useful arts, as to have water conveyed in pipes into its city and into its houses. Three hundred thousand people have taste enough to be in die-away ecstacies at the singing of Madame Pasta, or the dancing of Taglioni, and have not taste enough to appreciate or feel the want of a supply of water in their kitchens, sculleries, drains, sewers, and water-closets. The civilization of an English village is, after all, more real civilization than that of Paris or Berlin."]

FREEMASONS OF THE CHURCH.

JULY 14.—Mr. French, architect, in the chair. Monsieur Louis Vellino exhibited a series of carvings in wood, by the celebrated artist Bouzanigo, representing Peace and War, portraits of emperors and kings, &c., &c., all executed with artistic feeling, and incredible minuteness, and grouped together with garlands of flowers. These carvings occupied fifty-eight years to execute. Mr. J. W. Archer exhibited a design for a monumental brass, and offered the following observations:—The cross upon the brass is a speculative restoration from an incised stone in the church at Minster, Kent. The type of the vine is represented in the head of the cross according to various passages in Holy Scripture. In the arms of the Latin cross, and supporting the sigil which contains I H S, are four angels; a similar composition occurs in the church of St. Prassede, Rome. The latter work is a mosaic, in which four angels support a medallion, containing the head of our Lord. The decoration in the stem of the cross is typical of strength in faith. The colours are typical, and the general intention is to represent the feeling of monumental art termed Giottotedesca, at the time of the revival of art in Italy, and that which prevailed in England in the reign of Henry III.

Mr. Edward W. Smith, of Bedford, alluded to a fine ruin of one of Inigo Jones's mansions, Houghton Conquest, it is a perfect ruin; Mr. Smith undertook to lay down a ground plan from actual admeasurement; he has also made a sketch of the elevation.

Mr. George Isaacs then delivered a lecture on the subject of "Flemish or Stone-ware of the 16th century." He commenced by observing, how little attention had hitherto been paid to the subject, and that even Brogniart in his profound and elaborate work "Les arts céramiques," had rather obscured than elucidated it. The various kinds differing in their colour and character were explained from numerous specimens laid before the society. Much attention was excited by a magnificent bottle, bearing the portrait, armorial bearings, and badges, of the Emperor Charles V.; and several fiancilles or cups, used in ancient times as presents of betrothal. Of the latter character, seemed to be one upon which were depicted Albert and Isabella of Austria. Nor was among the least curious a puzzle or wager-jug of brown ware with slashes in the neck, making it impossible to drink from, except from a small aperture in the lip of the vessel. This example is said to be unique. Little is known with regard to the places of the manufacture of stoneware, but it appears from some circumstances, that it was made in the heart of Germany, that is to say, in the neighbourhood of Rabisbound and Bareuth, towards the year 1600. Those bottles in the form of an elongated truncated cone, called canettes, were probably produced in Mansfeldt, in proof of which is adduced a very fine one to be seen in the Kunst-Kammer, at Berlin, and said to have been presented to Luther by the town of Eisleben, his birth place. The lecturer endeavoured to disprove the assertion that Jerome Hopfer was employed in designing ornaments upon some of these canettes, but at the same time gave a carefully collected series of artists' initials and monograms, from specimens in various cabinets here and on the continent. It was also shewn that none of the ancient stoneware jugs, whether of the pearly grey colour, the blue, the brown, or polychrome, have any title to the epithet *Italian*, nor have the arguments of Mr. Hausmann in favour of an *Italian* jug any weight at all, when we consider that the specimen cited by him bears a monogram constantly found on specimens undoubtedly Flemish.

ON THE ARTS AND ARTISTS OF ENGLAND.

THE following is the substance of a paper read by Sir Richard Westmacott, at the late meeting of the Archæological Institute, in York.

Sir Richard observed, that as the arts are intimately connected with the epochs in which they are practised, and mark the state and variations of civilization and manners more forcibly than any other criteria of their age, he had ventured, as sculpture holds a distinguished place in the mediæval arts of England, to submit a few observations on its progress with us, and, where possible, on the artists who practised it. In tracing the history of the arts generally, from their fall to their revival, the transition from the pagan idolatry to the Christian religion, we are naturally induced to reflect on the similarity of causes to which they owed at once their destruction and regeneration. We owe the revival of the arts wholly to religion, but Christianity, which had made great progress in the 3rd century, notwithstanding the persecution it endured, had scarcely ascended the throne of the Cæsars, when the Christians in their turn became the persecutors. These again became divided, new sects arose, and their consequent antipathies led to universal bigotry. A country so divided became an easy prey to the invader, and degeneracy in civil habits increased, until the pure principles of Christianity were lost in superstition. These dissensions are the more to be lamented, as art, and sculpture more especially, gave promise, under the first emperors, who had embraced Christianity, if not of being restored, at least of being sustained with no mean effect. That art owes much to the pious regard which all countries have shewn to the dead. The Athenian states offer abundant examples, as also Rome and its colonies, whilst the vast Necropolis, lately discovered in the country of the Volscii, the extent of which is yet unknown, displays a degree of magnificence and care for the preservation of the dead quite astonishing. This consideration was the more extraordinary, as though their heroes were canonized, and presumed to be ever near them, the Ethnick doctrines place death as everlasting sleep; but when the mysteries of religion became revealed to us, and resurrection assured through the merits of our Saviour, a new sense arose, and a new feeling towards the dead, and the subterraneous depositions, as may be seen in the earliest crypts of Italy, attest the early and pious belief of a future state in the numerous effigies of the raising of Lazarus.

When St. Austin was sent to convert the Saxons, 596, Pope Gregory I. instructed him to accommodate, as he could, the Christian forms of worship to those of his disciples—to convert the heathen temples into churches, and to establish Christian in the place of pagan rites. This will account, probably, for the preservation of many pagan symbols which we find in this country. Pisa may be considered the cradle of the restoration of art, from the 10th to the 14th century. The Crusades may also be considered as having been conducive to the prosperity of the arts, as, from 1144 to 1228, that is from the 2nd to the 6th Crusade, not less than six hundred religious foundations were established. The most polished people with whom the Crusaders mixed had likewise had their attention attracted to the sister arts, and painting and sculpture were called in to assist in the embellishment of those pious edifices. The effect of this religious zeal may be seen in Rochester and Wells Cathedral, and many other churches of that age. The revival of sculpture we must consider to have been formed on the remains of Grecian and Roman art, there being a constant struggle on the part of native genius to banish the Lombardic Gothic, which, owing to German influence at that period, and to the skill which German artists had exhibited, was established throughout Italy. The character of Anglo-Saxon art, which prevailed to 1189, we may consider to have changed gradually through the Plantagent family to Henry III., when the decorative style of architecture gave full employment to, and demanded the greater efforts of the sculptor. Notwithstanding the check which ecclesiastical authority had received so early as the reign of Richard II., the church yet exercised an extensive control over the construction of religious edifices, as we find, with the magnificent buildings of antiquity, that the priests, or hierophants, controlled the erection of all works of a religious character. In one century, no less than five priors of Canterbury made architecture their study, and there can be no doubt that the cathedrals and monasteries, erected from the Conquest to the 13th century, were designed principally by churchmen. Sir Richard afterwards alluded to the services rendered to art by Henry III., to whom may be ascribed the most beautiful works we possess of the mediæval age, observing that the number of artists in England, during his reign, must have been considerable, but he had strong doubts whether painters and sculptors, Englishmen of talent, were really found in the provinces. Henry, it is well known, was very partial to foreigners, and a considerable number of the benefices in England was held by them. He (Sir Richard) had little doubt, from the peculiarities of taste which arose at that time, not only in England, but throughout the north of Europe generally, that it was induced by the introduction of foreigners. He was far from designing to derogate from the fair claims of his countrymen, and desired to be understood that in the good art of those ages, although the greater part may have been executed by English artists, the taste and direction was by foreigners. Until the fourteenth century, England had full opportunities of cultivating the arts of peace, and must have depended in a great degree on their communication with Italy. About Henry the Fifth's reign, the character of sculpture was vigorous, and, though rude in execution, was by no means deficient in feeling or expression. Sir Richard then referred to the last period of mediæval art in England, in which the florid style of architecture then adopted demanded all the powers of the artist and of the sculptor, more especially in the exuberance of embellishment then displayed in religious edifices. From this period we may date the extinction of mediæval art. The taste which followed, and which applies to every country in Europe, was of a mixed character, engrafting the Italian and German manner with the old, and which left nothing either in architecture or sculpture to redeem the innovation. Henry the Eighth, though without the genius to improve, had the judgment to select the best which was then offered to his choice. He distinguished merit, and his catalogue of artists of the period contains the names of fifty persons, most of whom were employed by him.

TEWKESBURY ABBEY CHURCH.

VIEW FROM THE WEST.*

ON ARCHITECTURAL SHADOWS.

BY T. S. DAVIES, F.R.S.
PROFESSOR OF DESCRIPTIVE GEOMETRY IN THE COLLEGE FOR CIVIL ENGINEERS, PUTNEY.

Sir,—I perceive with regret that you have inserted a paper on this subject, in which the character of the problem seems misapprehended.† May I, therefore, beg of you, for the sake of your student-readers, to insert also the following, where the problem is taken in all the generality of which it is susceptible? It will appear from what is here given, that whatever be the direction of the rays of light, the problem is equally simple (both in theory and in practice) with that particular case ordinarily employed by architects, viz., when the rays are parallel to the diagonal of a cube, two of whose faces are parallel to the plan and elevation of the drawing.

The present solution has reference alone to finding the shadows on the plan and elevation; as, to develop the general problem of shadows with any degree of completeness, would require more space than you could afford, and probably more time than I could just now command.

As the Descriptive Geometry is the *true* foundation of the entire process of shadows and shadowing, and as there is no English book to which I could satisfactorily refer the reader, I have been obliged to occupy a considerable portion of this paper with mere preliminaries, which I should have wished, had it been practicable, to avoid.

If it should be compatible with your plan to allow me sufficient space, at some future and not very distant period, I shall be glad of the opportunity of rendering the subject tolerably complete. Should it, however, not be in accordance with your views, do not scruple to say so, as my work on descriptive geometry, when published, will, at all events, place the theory and practice of this, as well as other applications of Monge's general methods, within the reach of my professional countrymen.—I am, Sir, &c.,

T. S. Davies.

Charlton, Kent, July 24th, 1846.

In the solution of this problem, in its utmost generality, only the very simplest principles of descriptive geometery are required; but as no work that can be referred to in England contains the development of those principles in a truly scientific form, it will be necessary to premise the propositions which we shall require in the solution.

I. A point or a line, as every architectural student knows, is given when its projections on the plan and elevations are given; these planes occupying their true places at right angles to each other.

In the annexed figures, the *eïdograph*, or representation of the system of lines, is a rude sketch of the planes and lines which occur in the problem, drawn after the manner of Euclid's eleventh book; and the *orthograph* is the result of supposing a total removal of all the parts of the eïdograph exeept those which lie in the plan, XY, and elevation, XZ; the elevation plane, XZ, being also revolved about the ground line, OX, into coincidence with the plan XY. Figs. 1 and 2.

Now in the eïdograph, let A be any point; and let perpendiculars, Aa_1, Aa_2, be drawn to the plan and elevation respectively. Then the plane, a_1Aa_2 will be perpendicular to both the planes, XY and XZ (*Euc. xi.* 18), and hence (*xi.* 19) perpendicular to OX, and, finally, (*conv. xi.* 4) the lines a_1a and a_2a are also perpendicular to OX.

Again, a_2, a being in a plane XZ perpendicular to XY, and at right angles to the common section OX, it is perpendicular to the

* See p. 373. † P. 175, *ante*.

ILLUSTRATIONS OF ARCHITECTURAL SHADOWS.

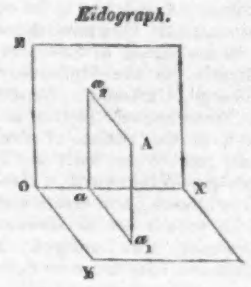


Fig. 1.

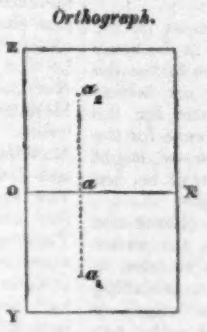


Fig. 2.

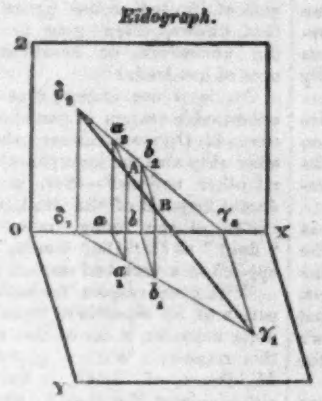


Fig. 3.

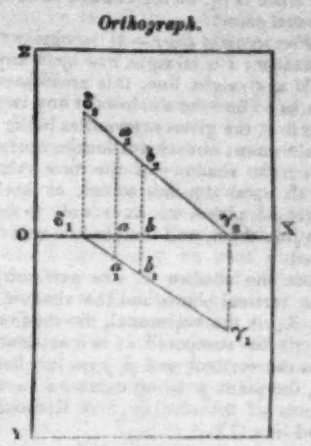


Fig. 4.

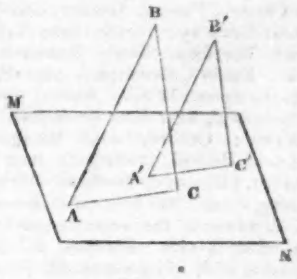


Fig. 5.

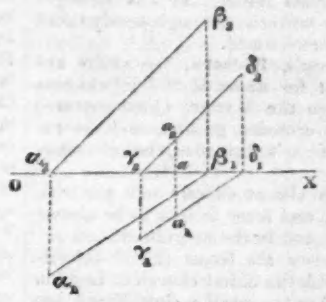


Fig. 6.

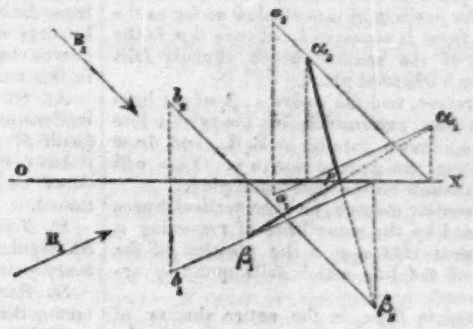


Fig. 7.

plane XY (*xi.* 38), and hence (*xi.* 6) a_2a is parallel to Aa_1. Similarly it is proved that a_2A is parallel to aa_1; and hence Aa_2aa_1 is a parallelogram. Also it has one right angle a_2aa_1, and is therefore a rectangle (*i.* 29 and 34).

Let us now conceive the lines Aa_1, Aa_2 to be removed, leaving the lines a_1a, a_2a in their respective positions in the planes XY, XZ. Then let us conceive the plane XY to be revolved about OX till it comes into coincidence with the plane XZ *produced*. The result will be the *orthograph*. Then since Xaa_1 is a right angle, and the relation of Xa to aa_1 is not altered by the revolution about Xa, it will be a right angle in the orthgraph; and a_1aa_2 becomes a single straight line perpendicular to OX.

In this it will be seen at once, that aa_1 is the height of the point A of the eidograph *above* the plane XY, and that a_1a is the distance of the same point A *before* the elevation XZ. And if we take away the frame-work of the planes XY, XZ, we shall have the ordinary "descriptive representation" of the point A of the eidograph.

Again, if there be a second point B in the eidograph, its "descriptive representation" will be b_1bb_2, as in the figured orthograph.

Also, if AB be a given line in the eidograph, the projections a_1b_1, a_2b_2 constitute its descriptive representations in the orthograph. Figs 3 and 4.

II. Let us now conceive the line AB produced both ways (if necessary) to pierce the plan and elevation planes in γ_1 and δ_2. These are called the *traces* of the line AB. Then two converse problems arise, which it will be necessary to specify.

PROBLEM A.—*Given the projections of the two points in a line, to find the traces of that line.*

ANALYSIS. — Let the eidographic plane ABb_1a_1 be produced and cut XY, XZ, in $\gamma_1\delta_1$, $\delta_1\delta_2$, and the plane ABb_2a_2 to cut them in $\gamma_1\gamma_2$, $\gamma_2\delta_2$. Then, since both planes pass through AB, their intersection is the line AB produced to meet the planes XY, XZ; or γ_1, δ_2 will be the *traces* of the line AB.

Now since by the definition of orthographic projection, Aa_1 and Bb_1 are perpendicular to XY, the plane $\gamma_1\delta_1\delta_2$ is perpendicular to XY (*xi.* 18). Whence, since the two planes $\gamma_1\delta_1\delta_2$ and XZ are perpendicular to XY, their intersection $\delta_1\delta_2$ is also perpendicular to XY XY (*xi.* 19); and hence (*xi.* 4) $\delta_1\delta_2$ is perpendicular to OX. But a_1, b_1 are given, and hence the intersection δ_1 of a_1b_1 with OX is given; and therefore the vertical trace of the line AB is in the given perpendicular from δ_1. Moreover, the vertical trace of AB is in the given vertical projection a_2b_2 of the line AB. Whence it is their intersection.

In the same way the horizontal trace is shewn to be the intersection of a_1b_1 with $\gamma_2\gamma_1$; and the following simple construction results:—

SYNTHESIS.—Let a_1b_1, a_2b_2 be the horizontal and vertical projections of the line AB upon the *orthograph*. Produce them to meet the ground line OX in δ_1 and γ_2 respectively. Draw the perpendicular $\gamma_2\gamma_1$, $\delta_1\delta_2$ to meet the projections a_1b_1, a_2b_2 (produced if necessary) in γ_1, δ_2. These will be the traces required.

The demonstration is obvious from the analysis and need not be put down here.

PROB. B.—*Given the traces of a line to find its projections.*

The following construction results from a slight variation of the preceding analysis.

SYNTHESIS.—Let γ_1, δ_2 be the traces on the orthograph of the given line. Draw $\gamma_1\gamma_2$, $\delta_2\delta_1$, perpendicular to the ground line OX; and join $\gamma_1\delta_1$, $\gamma_2\delta_2$. These are the projections of the entire of the *visible part* of the line; that is, of the part which lies in the "region of space" inclosed by the two planes which are opposite to the spectator.

III. *The projections of parallel lines are themselves parallel, whatever be the plane of projection, and whatever be the direction of the projectors.*

Let MN be the plane of projection, AB, A′B′ two parallel lines meeting MN in A, A′. Take any points, B, B′ in these lines, and draw BC, B′C′ parallel to the pattern-projector, meeting MN in C, C′.

Then, since BC, B′C′ are parallel to the pattern-projector, they are parallel to one another (*xi.* 9). Wherefore the two lines, AB, BC, are respectively parallel to the two lines A′B′, B′C′, and, therefore, the planes ABC, A′B′C′ are parallel (*xi.* 15).

Again, since the parallel planes ABC, A′B′C′ are cut by the plane MN, their sections, AC, A′C′, with it are parallel (*xi.* 16); and these are the projections of AB, A′B′ upon the plane MN by projectors parallel to a given pattern-projector. Whence, &c.

The proposition as here enunciated is somewhat more general than we require just now: but as the demonstration is precisely similar to that more limited case of orthographic projection, I have put it down in the general form.

IV. It follows from the preceding investigation, that if the projections of two lines upon both the horizontal and vertical planes be parallel, they are the projections of parallel lines. Or, in reference to the annexed figure, where $a_1\beta_1$, $a_2\beta_2$ are the projections of a line continued through the whole visible region, and $\gamma_1\delta_1$, $\gamma_2\delta_2$ parallel respectively to the former projections are the projections of another line, the two lines projected will be parallel. Fig. 6.

It also follows, that if the projections a_1, a_2 of a point be given, and likewise those of a line $a_1\beta_1$, $a_2\beta_2$, then if it be required to draw the projections of a line through the given point which is parallel to the given line, we have only to draw through a_1 the line $\gamma_1\delta_1$ parallel to $a_1\beta_1$ in the horizontal plane, and through a_2 the line $\gamma_2\delta_2$ parallel to $a_2\beta_2$ in the vertical plane. These will be the projections required; and the traces of the line, γ_1, δ_2 will be determined as already explained in II.

Having disposed of these preliminary matters (which certainly ought to be amongst the *most ordinary topics of professional education*, and I trust the day is not distant when they will be so), I proceed to the main purpose of this letter, viz.

V. Fig. 7.—*The projection of Architectural Shadows.*

1. *For Points.*—Let OX be the ground-line, R_1, R_2 the horizontal and vertical projections of the pattern-ray, a_1, a_2 the projections of a point, and b_1, b_2 those of a second point.

Through a_1, a_2 draw the projections of a line parallel to R_1, R_2, and find its traces α_1, α_2. Now the *visible one* of these traces is α_2 on the *vertical plane*, and is the shadow of the given point, whose projections are a_1, a_2.

Similarly draw the lines as in the figure, through b_1, b_2, and find the traces of the line so represented, viz., β_1, β_2. In this case the *visible trace* is β_1, or the shadow falls upon the *horizontal plane*.

2. *For straight lines.*—It is obvious that as the shadow of a straight line upon any plane is itself a straight line, this problem only requires us to find the shadows of any two points in that line, the given extremities being usually the points most convenient for the operation.

When the shadows of the two extremities fall both upon the horizontal, or both upon the vertical plane, we have only to draw the line to join them, and the shadow will be constructed.

When the shadow of one extremity, a_2, is on the vertical plane, and the shadow of the other, β_1, on the horizontal, the shadow of the line will be composed of two separate parts, $_2p$ on the vertical, and $\beta_1 p$ on the horizontal plane, the point p being common to the two segments of the shadow, and situated in the ground-line OX.

Now it is quite clear that if the vertical plane were removed, the line $\beta_1 a_1$ would be the shadow on the horizontal plane. The presence of that plane in its place, therefore, does not affect the position of that shadow so far as the part in front is concerned, whence $\beta_1 p$ is the portion of the shadow which actually falls upon the horizontal plane.

Wherefore, find the traces a_1, β_1 of the lines through the extremities of the given line (a_1b_1, a_2b_2) drawn parallel to R_1R_2, and draw $a_1\beta_1$ cutting the ground line in p. This will be the shadow on the horizontal plane.

In a similar manner, find the vertical traces a_2, β_2, and by the same kind of reasoning it will appear that $a_2 p$ is the position of the shadow of the line which falls upon the vertical plane.*

Wherefore $\beta_1 p a_2$ is the entire shadow of the line whose projections are a_1b_1, a_2b_2, the rays being parallel to R_1, R_2.

The application of these principles will enable us to find the shadow of any figure bounded by rectilinear edges, whether it be plane or solid, with considerable facility. Some modifications may be advantageously introduced when the parts of the figure have specified relations, especially when there are several sets of parallel lines—a circumstance of continual occurrence in architectural figures. A few remarks on some of the more frequently occurring cases may be useful, and will probably be hereafter given in this work.

With respect to the shadows of curves and curve surfaces, we can only as a *general rule* find the shadows of points taken conveniently in them, and connect these points by hand in the usual manner. Certain cases, however, form exceptions to this general rule; and, fortunately, these cases include the far greater part of architectural curves and curve surfaces. Upon these, too, a few remarks will be necessary.

* If it should be questioned whether $a_1\beta_1$, $a_2\beta_2$ must *necessarily meet* OX in the same point p, we have only to reflect that the lines a_1a_2 and $\beta_1\beta_2$ are, in the eidograph, parallel lines, and hence situated in the plane of shade. That plane cuts the horizontal and vertical planes in the lines of shadow, and consequently the lines of shadow cut OX in the same point that the plane of shade cuts it. Whence the conclusion follows.

STATE OF THE LONDON CHURCHYARDS.

"Give us a little" (more) "earth, for charity."

Sir,—In *agriculture* the number of *sheep* to an acre should, I believe, be *five*, at the utmost, sometimes four.—Now were any one to shew us an acre and say, "that will be the sole food of at least *twenty-five* sheep for the next twelvemonth," should not we be struck with horror, and try to prevent, if possible, such inhumanity? Change common humanity for decency and health, but retaining a spice of the first, as regards the feelings of survivors, and we have too true a principle and calculation applicable to the state of provision for the dead in London.

Our "pious ancestors" are not to be blamed for this. They provided for the necessities and perhaps prospects of their times, and could not in 1500, or even 1700, anticipate the requirements of 1846. Neither are the clergy, though it might be as well if they were to express their opinions more publicly. The writer knows that some of the most justly esteemed of them would be favourable to any fair or better plan. If parishioners will continue to keep up, amidst successive increases of population, these shockingly crowded places, and provide nothing better, how can one man of limited means (great part of which, God knows, often goes to the poor) help the unconcern, or heartlessness, or meanness of hundreds?

Or, is it not enough that here, as in the abominable system of punishment in the army (now, by Divine goodness, about to follow the slave-ship and the inquisition), we are behind all other nations?—that, in respect for the decent disposal of the dead, and care for the health of the living, many savages might "flout" us? "Bad words," it may be, but applied to a very bad state of *things*.

With great respect for both the church and parish of *St. Sepulchre*, Snow-hill, the writer must consider it *one* of the worst situated in this respect. With a population including Middlesex, of 13,500, it has two "slips" on either side of the church, which together can scarcely, if at all, exceed a *quarter of an acre*. There are vaults under the church; but if any one, having perceived the effluvia some yards from the opened door, can descend, unimpelled by duty or private feeling, he has stronger nerves than the writer's, although sorely taxed in this troublesome world.

At *St. Andrew's*, Holborn, the vaults are inoffensive; but for about 55,000 inhabitants (with St. George the Martyr, Queen-square) it has only this crowded ground, and the *reduced* one in Gray's Inn-road, before mentioned.

St. Bride's is almost exactly on a par with St. Sepulchre's, and fever is said to be almost every year produced in the neighbourhood.

St. Bartholomew the Great (2,000 inhabitants), Smithfield, the oldest church in London or Middlesex, has too small a churchyard, but by no means in proportion to the foregoing. The same applies to *Cripplegate* (15,000 inhabitants), where is a bastion of the old wall of London.

St. James's, Clerkenwell, with about 60,000 inhabitants, has the limited ground, certainly considerably less than an acre, at the church—all trodden ground—grass is rare and evanescent; perhaps an acre at Pentonville Chapel rather better, but inconvenient for this distance; and a small plot, common to *St. John's*, which has its own "slip" at the back of the church, still less. It is needless to say that these parishes require, for decency and propriety, some where, at least *four* times as much now; and what will they do, with many others, 100 years hence? The excellent rectors, Messrs. Faulkner and Hughes, the writer knows, are amongst those who would be favourable to a better state of things.

J. D. Parry.

P.S. May a few words be permitted on *St. Pancras Church*, alluded to in a previous number? You have omitted what you would well know, on consideration, viz., that besides Mr. Inwood's being sent to Athens by the parish (at perhaps some 200*l.* expense only) he published a handsome folio on the *Erectheion*, with good plans and engravings; this Erectheion *Ionic* having beautiful mouldings, copied all round St. Pancras, not to be found in any other instance. You have not mentioned, also, that the columns surrounding the tower have the lotus-leaved capitals first found by *Stuart*, at the *Temple of the Winds*, copied above. If the upper part of the capitals had been filled in, they would have been beautiful. The windows and "Greek tiles,"—instead of ballustrades or coping—are unhappily ugly. But the eastern central sweep is elegant,—after the "Choragic monument" or "Lantern;" and within it are six very bold *verd antique* columns of scagliola. This church is *said* to have cost 70,000*l.*; more than *double* St. Martin's, and *eight* times St. James's.

J. D. P.

West Ham Gas Works.—The tender of Messrs. Curtis, of Stratford, for the erection of these works, has been accepted. The contract is 1,994*l.*, which includes two gasometers; all to be completed within two months. Messrs. Curtis's estimate was 200*l.* less than one, and 80*l.* below several other tenders.

PROVINCIAL NEWS.

At a meeting of the Society for building, enlarging, and repairing churches and Chapels, held on the 20th July, it was determined to grant assistance towards the erection of eleven new churches for 27,000 persons; the rebuilding with enlargement of seven parish churches; and the enlargement of nineteen churches and chapels. Seven of the new churches are to be for the accommodation of the inhabitants of districts to be endowed by the Ecclesiastical Commissioners—viz., Northward, in the parish of Stoke-on-Trent. Hope and Etruria, in the Staffordshire potteries. St. George, Darlaston. Denton, near Manchester. Prestoke, near Bolton-le-Moors, and Coldhurst, in the parish of Prestwick. The remainder are to be built at Cirencester, Idregthay-par-Winksworth, Henley-on-Thames (a free church), and Greenwich. The churches to be rebuilt are at Baildon, near Bradford; Tremaer, near Cardigan; Birkenhall, near Taunton; Ellerton, near Selby (now propped up and expected soon to fall); Ewell, Surrey; Llanvabon, near Cardiff (very much dilapidated); and North Formby, near Hull. The churches to be enlarged and otherwise rendered more efficient are at Ditchingham, near Bungay; St. Columb Major and Stratton, in Cornwall; Elworthy, near Taunton; St. James's Church, Preston Hutton, near Wells; Ifield, near Crawley; Heath, near Ashby-de-la-Zouch; Dartford, Kent; Balcomb, near Cuckfield; Eaton Constantine, near Shrewsbury; St. Sampson, York; Globy, near Leicester; Lingfield, near East Grinstead; Stow-in-the-World; Othery, near Bridgewater; Nailsea, near Bristol; Ardington, near Wantage; and St. Olkmund, Duffield, Derbyshire. The society, since 17th Nov. last, has expended 20,360*l.* towards the erection and the rebuilding of sixty-nine churches, for the accommodation of 37,367 persons, 30,277 of them free. At last meeting, 5,540*l.* of the above sum was voted.——The church of St. Lawrence, Reading, is to be repewed and restored by subscription, at an expense of 2,000*l.*, according to architectural plans and estimates lately prepared.——The church of Bebington is also to be renovated.

THE IRON TRADE.

The quarterly meetings of the iron masters are over, the last of them being held at Birmingham on Saturday week; to which meeting all final arrangements were deferred. Attempts had been made to change the quarter day, but the effect intended was not produced. As it is, however, fortunes have been won and lost in the uncertainties attendant on the anticipations of the holders. The demand for iron for railway purposes has not been so great as has been represented, and the anticipatory statements which have occasionally appeared, have in some respects been fallacious; but the quarterly meetings of the Staffordshire masters went off with a decided tendency to high future prices. They had resolved, on the special ground of a stoppage of works in England, Wales, and Scotland, from the intense heat, more than for other alleged reasons, to raise the price of iron at the July quarterly meeting; an advance of even 1*l.* a ton being meditated by one of the largest makers in South Staffordshire; but the prices of the previous quarter-day were in the main barely supported. Bar iron, however, is said to have fetched about 10*l.*; hoop, 10*l.* 10*s.*; and pig, 4*l.* 15*s.* up to 5*l.* 10*s.*; and since the quarterly meetings the demand in the Scotch iron trade, at least, has been very great; the prices following, at Glasgow, being not only firmly maintained, but still manifesting an upward tendency:—"Glasgow, July 17th. A large business has been done by the dealers at 70*s.* for No. 3, 72*s.* 6*d.* for mixed Nos., and 74*s.* to 75*s.* for all Nos. Cash f.o.b. Several contracts have been made by makers, at 77*s.* 6*d.* for all No. 1. Cash on delivery.—July 18. The price of Scotch pig-iron, delivered free on board here, may be quoted to-day at for all No. 1, and for 3-5ths No. 1, and 2-5ths No. 3, 75*s.* for all. No. 3, 70*s.* 6*d.* and 71*s.* 6*d.* The makers have effected sales at 80*s.* for mixed Nos., less 4 per cent. discount, cash in a month. The demand during the week has been very great, and the above prices for the present are firmly maintained, there

being as many buyers as sellers." On July the 25th, the quotations are 73s. to 74s. for all No. 1, and for 3-5ths No. 1 and 2-5ths No. 3, 71s. to 72s. per ton net cash, with but few buyers, however.

RAILWAY JOTTINGS.

The actions against provisional committee-men have had a severe check at Lincoln lately, where in every case the plaintiff was nonsuited. ——The Gauge of Railways Bill has gone through committee in the Commons.——The jury, in the Eastern Counties Railway accident case, in finding a verdict of manslaughter against the engine driver, Clare, have declared that "culpability attaches to the management of the Eastern Counties Railway in not taking care that their rules are observed, in the exhibition of signals, in want of punctuality, and in the appointment of incompetent persons." ——The establishment of an uninterrupted electro-telegraphic communication for Government use between the metropolis and Gosport is now so far realized, that wires are being laid across the harbour of Gosport by Messrs. Coon and Wheatstone's workmen.—— Atmospheric pipes increased to twenty-two inches diameter are said to be in course of formation for the South Devon line of railway. ——The arches of the new brick bridge across the Syston and Peterborough line, near Peterborough, has given way, and the contractor and his workmen have been dismissed.——The telegraph on the whole of the Midland line, from Leeds to Birmingham, and from Derby to Nottingham and Rugby, is at length completed, and in successful operation, at an estimated cost of about 40,000*l*. The distance between Birmingham and Derby is forty-one miles.——The Nottingham and Lincoln Railway was opened on Monday last by a special train, which completed the distance between Derby and Nottingham in less than half an hour.——A monument to the memory of the men who have lost their lives by accidents on the Shap district of the Lancaster and Carlisle line during its construction, has been erected in Shap church by the contractors, Messrs. Hutchins and Brown.——On the stations of the Edinburgh and Northern Line there are at present 4,536 labourers and workmen employed.——1,200 men, employed on the first contract by the Messrs. Jeffs on the Mullingar line from Dublin to Enfield, have struck work because the ticket system so much complained of by the men themselves has been discontinued, and because the wages were to be henceforth paid by the fortnight instead of by the week. ——The Minister of Public Works at Paris is said to be resolved to establish a school of instruction there for drivers of locomotives on the French railways.—— The Paris journals of Monday week report the sinking of a portion of the unfinished Orleans and Vierzon Railway, near to Orleans, on the preceding Saturday, on which day, also, according to the *Journal de la Somme*, a part of the tunnel of the Boulogne and Amiens line, near Amiens, suddenly gave way, with a loud crash, in the midst of a shower of rain.—— The Austrian Government is said to have decided on the speedy formation of a line of railway from Vienna to Salzburg, and the Bavarian Government on the formation of one from Salzburg to Munich.——The Hanoverian Government's credit of 11,000,000 thalers (about 40,333,330 francs) for the formation of a line from Hanover to the Hesse electorate frontier has been accepted by the Hanoverian Railway Commission.

Responsibility of Railway Engineers. —On the Oxford Circuit, in the case of Collins and others, as the managing directors of the Dudley, Madeley, and Ironbridge Railway Company, against Giles, their engineer, to recover damages for his negligence and carelessness in the preparation of the requisite plans and sections, which prevented the company from successfully going to Parliament with them; it was shewn that the losses incurred by the company in consequence of the defendant's negligence amounted to at least 20,000*l*., and that the defendant had received from them 4,500*l*., of which he had paid 2,800*l*. to those employed by him in the preparation of the plans and sections. The Jury, after a few minutes' deliberation, found for the plaintiffs—damages 4,500*l*.

OFFICIAL REPORTS ON COLLIERY EXPLOSIONS.

By Sir H. De La Beche and Dr. Lyon Playfair.

These important and much called for documents have been recently lodged, in conformity with the Government instructions, instituting chemical and other researches into the nature and causes of colliery explosions, and the advisable or practicable remedies for the evil.

The general result of the examination into the physical and chemical constitution of the fire-damp is, that though, in many cases, the explosive material exists and accumulates from the gradual decomposition of the vegetable nature of the coal, in the *gaseous* form, it is frequently condensed in crevices amongst the coal in the form of a liquid, which suddenly expands to the gaseous form so soon as the pressure is insufficient to sustain it in the form of a liquid; that in opposition to the results of the researches of continental chemists, the reporters have found no trace of olefiant gas in the eight pits which they have examined, and in which the explosive or inflammable constituent or fire-damp was found to be carburetted hydrogen, without even any trace of free hydrogen, except in one instance; that nitrogen is the next element, amounting in some cases to 21 per cent. of the whole, and that this, together with carbonic acid, formed by the exhaustion of the vital air of the pit, by combination with the carbon, forming one of the decomposing elements of the coal, constitutes the poisonous after-damp, which has been found to be even more fatal than the explosion, more especially as it exhausts the remainder of oxygen, often sufficient for respiration after the fire-damp has exploded. Incidentally the reporters recommend, as a partial remedy for this evil, that cheap mixtures, capable of absorbing carbonic acid, such as glauber salts and lime, should be used at least by those who try to aid the sufferers after an explosion. "Such a mixture placed in a coarse bag and applied to the mouth would effectually absorb the carbonic acid, and prevent it exercising an injurious effect on respiration."—[A recommendation, by the way, which ought to be kept in view by workmen and others in the habit of descending into wells, &c.]

Explosions, however, are attended with results so complex, that the reporters hesitate to recommend any one preventive or remedial course in particular, although they suggest the use of fanners in the mine for the purpose of more thoroughly diluting the fire damp while accumulating; as, being lighter than air, it tends to occupy an upper stratum, apart from the wholesome air, but more liable to act as a train for explosion leading to a repetition of the evil in upper galleries or other reservoirs of the carburetted hydrogen. Plans, they observe, have been adopted for the purpose of taking advantage of this tendency to ascend, by draining the mine of fire damp through pipes, as through a chimney, but the conditions being so various, they do not stop to consider such plans. Proper general ventilation of the colliery is what is more particularly desirable, but "as a whole their general ventilation is very imperfect, good as it may be in some collieries, particularly in certain districts." They deprecate the too common use of single shafts divided by wooden partitions for ventilation, but there is no allusion to, or attempt made to propose any effectual or decidedly improved or promising system of ventilation. The principal recommendation of the reporters is "an extension of the principle which regulates the employment of women and children in our mines and the labour in our factories, effective discretionary powers being vested in properly qualified persons appointed in convenient districts, so that the needful adjustments to conditions may be effected, and no single system be attempted inapplicable to our collieries as a whole."

"Should the suggestion of a system of judicious inspection be considered worthy of consideration, the ready access to proper plans and sections of collieries, brought up to given times, would necessarily form a part of any general system of regulations. If correct (and power to ascertain that they were so would be essential), they would at once disclose the system of working and ventilation adopted, and, with information respecting the police regulations, and an account of the kind of lights employed, would at once afford a general view of the mode of conducting any particular colliery, and of the adjustment of the workings to conditions."

The necessary funds, the reporters calculate, might be raised from the districts under superintendence "by a very slight impost, not even exceeding one farthing on each ton of coal raised in it."

It appears from the remarks of the reporters on the Davy and other safety lamps that the seemingly paradoxical fact is, that the very safety of the Davy lamp, and its use, have increased the mortality arising from explosion, inasmuch as it has enabled or tempted coal proprietors to work in "fiery" and dangerous seams, where previously no such idea would have ever been for a moment entertained. They add that as fire-damp does not exist or does no injury in some districts, it would be unjust to compel the indiscriminate or general use of safety lamps throughout the collieries. Professor Grove's safety lamp of electric light, though imperfect, is favourably alluded to by the reporters. The light in this lamp is struck between two coils of platinum wire inclosed in two concentric glass vessels, the outer one filled with water so as destroy the light should the inner one be broken.

THE YOUNG ARCHITECTS OF ENGLAND.

BY ONE OF THEMSELVES.

No. III.

Sir,—There is very much in the idea of Mr. Lamb as we have it in your last week's "Miscellanea," that "the public wonder very justly that Architecture, advanced as it has been to the merely Mechanical, should rank as a Fine Art at all." Antiquarianism and soulless Method—have usurped the throne of our Art! Aliens utterly,—of other blood than ours,—of other laws,—ignorant of our very speech,—contemptuous to our faith,—their scorching rule has blighted our beautiful land! Patriotism is Treason; and they who will not bow before the alien throne are rebels and outlawed! Yet there are some (but—whisper low) there *are* some, living and loving alone and hid, who think of other days and other kings, and vow strange vows and pray strange prayers, and find strange joy in this.

In a lone room, damp-walled and fireless,—the midnight wind of March bowling without,—cold, but not feeling it,—cheerless, comfortless, but senseless to such,—there sits—perhaps a youth—perhaps an aged man. A book lies open; and his red eyes greedily devour the Thought. Or it is a picture that he muses on:—perhaps a statue;—a carving;—a device:—perhaps (although it may seem wonderful) a building. Or he writes—ponders and writes:—or draws—ponders and draws. Or it is Music that he loves—sweet melody—soft harmony—in the still night when grosser men have ceased their turmoil's jarring discord. How intent he is! He forgets the world,—forgets himself,—forgets the cold March night,—in some strange love. The chill of opening Spring is calm kind sunny Autumn. That cheerless home of his is lost—in the vision of a beautiful Heaven. The bleak black noon of night is *without; within* it is a brilliant day-light scene; and he is very happy. He is alone with *Art*—surrounded with The Beautiful. *He* is not in the dim damp chamber, cold and comfortless,—Earth singing a wild Winter-song without; *he* is far far away. Fool that he is,—poor dreamer! *Fool?—Dreamer?*—Nay.

And Alderman Beefeater, "Architect and Engineer, Surveyor, House-agent and Appraiser,"—Peter Beefeater, Citizen and Alderman, worthy man! is meanwhile snoozing *so* snugly. Now Beefeater is—in short, there is no nonsense with him; he is a man of the world, is Beefeater. He is rich; he—"looks after the main chance," does Beefeater. People may call him a Batty Langley*,—what does he care? If he never attempts anything *new*, he runs all the less risk of *going wrong*, as he jocosely says. He can refer you to chapter and verse for every atom of design he ever suffered himself to accomplish. He leaves *originality* to those who have a mind to *starve* (for Beefeater is a wag occasionally): he works for a living, *he* does; and, if he could make a better living thereby, if he wouldn't

* Batty was about the culmination of the Rule-and-Regulation system, a mighty man as an Architect of the real orthodox stock. He it was who discovered (not invented) the *five orders of Gothic Architecture.*

turn pork-butcher or greengrocer he says his name isn't Peter Beefeater. It's the money *he* wants, he says: and as for "the business," he was "brought up to it," and it's a good one—at least as good's is going; and *Art*—pooh! mere bagatelle—nonsense,—they don't know what they mean, these fellows—at least *I* don't—and I don't care;—give *me* the thing that *pays!* (Although, to tell the truth, this is only when Beefeater is angry—very angry, or very waggish, and then of course he exaggerates himself a little—Beefeater out-beefeaten as it were; he's not so bad a fellow at other times.) Art indeed! I suppose they mean picture sort of thing: wouldn't give five pound for all the pictures in the world. Can't get *dividends* off pictures—Eh?

Now, Beefeater, thou man of a gastric soul! do I blame thee? No; thou art right.

Dreamer; do I blame thee? No; thou too art right.

Ha! Paradoxical; whither away so fast? How is this?—We merely see two estimates of the world here,—two among thousands. The one hero of ours has his pleasures in being "rich and increased in goods and in need of nothing," a dignitary, a great man and "looked up to;" he dreams at times also, during his nap after dinner, of a great gilt coach—and men in armour—and Gog and Magog—and proclamations by one "BEEFEATER, *Mayor*"—and many other things wonderful to see: and thus he displays a theory of Life—an estimate of the world. Our other takes no pleasure in such things; but rather loves to rise alone into a high ethereal region where, among exquisite and subtile things, he finds a joy of rare refinement. And thus he forms another theory of Life—another estimate of the world. Beefeater thinks it a very fine thing to be an Alderman, and to sign proclamations: the Dreamer thinks all this must be but "weary, stale, flat, and unprofitable" at the best; and that it is a fine thing to sit alone and think of a thing called Art. And I have said that both are right: and it seems a paradox; for every one knows that the Beefeater theory is the orthodox one. With modifications here and there, it is the doctrine of mankind and womankind at large. Twelve good men and true would not hesitate a moment to pronounce upon their oath that Beefeater, all snoozing in snug bed at midnight in cold March, is by far a happier and wiser man than the poor visionary zealot with his *Art* forsooth! And they would snap their fingers as they said it, too.

But, alack and a-day! even juries sometimes err: "to err is human." And, in our present case, the maxims of the multitude are utterly at fault. Beefeater is *not* necessarily the wiser happier man.

There are two Worlds, two among a myriad. Beefeater is in the one; it is a Common-sense World; the Dreamer is in the other; it is an Art World. Each has its all-essentials and its non-essentials; and it happens that the two standards are not the same, indeed widely different. The pleasures and pains of the one are not at all the pleasures and pains of the other. But it does not therefore follow, that *this* one is false and that *that* one is true. Nor does it now altogether appear which is *really the dreamer*.

I have said that both are right. Neither is *really true*. If we judged truly of the world, all men would value all things justly, and therefore equally. But our MAKER hath not made us so. In every thing that which one counts all another counts nothing. We all form estimates intrinsically false in some respect; and, error producing failure, we all get thereby our respective shares of knocks and buffets in life; but some form estimates more false than others, inconsistently false, absurdly false; and Earth's machinery bewilders them, prostrates them, beats them to death perhaps. Wherefore the less false, the *commonly* false, I call, comparatively, true. And both the theories before us now are so. The All of the Dreamer will not apply to the real world; but it applies to *his* World, for he lives *altogether* in an ideal World, he is self-contained, he thinks not of other men—of the real world—at all. (And if your reader feel inclined to say—There are no such, you, Sir, and I know better). Beefeater applies his All to the real world, and there he finds himself in such an excellent majority that he can afford to laugh at other doctrines as *visionary*, can Beefeater. Thus both our heroes are (as the world goes) happy in their different opinions; and, therefore, both are right. But—here's the rub—there are men half Beefeater, half Dreamer, who live not *altogether* in an Art-World, but sufficiently so and in such manner (as it happens) as to apply their Art-estimate to the real world; and, finding it scouted, they *hate* the world; and these men are *fools*. Too many of Earth's brightest men are so. They open up their souls, as I have said, to a factitious misery; no pain can be more keen than that (though utterly a false one) which springs from a man building upon a false estimate of Life a horrible misanthropy. And hence, by the commonness of this, the intolerable conceit—contempt for every one who is not Artist, and, in another view, for every one who, being so, is not so to his mind exactly, which, to a proverb, is a feature in the common notion of a votary of Art. It is not the love of Art that makes a man this fool.

It is a false doctrine that the artist is *a visionary*. The Common-sense man is equally a visionary; only he happens to have the great majority—the earthy multitude—upon his side. Each has *his own world*, with its own peculiar desirables, its own All; and that is the reality—the philosophy of the matter. *Both* are visionaries, if you will. The Art-World is no more a false thing than the Common-sense World. The joy of having painted a good picture, and of looking on it, is not necessarily more false than the joy of being made a lord, and of looking on the coronet, or the joy of having done some great deed and of feeling the reward. We are not to decide the matter by *a vote*.

Thus it is that I was able to affirm, that when to the question—What is the chief end of man?—the answer, Architecture—or, say at present, Art—is returned, there are two senses in the answer, a right and a wrong. The right is when a pure Art-World is formed; the wrong when the Art-World and the Common-Sense World (which the jury decided to be the *real*) are confounded together. So that if you have waded with me through all this philosophy, you will be able to see perhaps the more clearly the true standing of Art; in fact, that he who gives it *supremacy* is not *a fool* therefore, although it is only in an *ideal* World that such supremacy exists; that he only is the fool who would maintain or expect that supremacy in the world of Common-sense.

And thus also it is that to him who forms a proper Art World, the *over* estimate of Art is the Love which is the Soul of Life; and that to him who does not so properly, the over estimate of art is frequently but a source of torment and hate.

That which you count all you must permit others to count nothing. And thus perhaps a little of the *evil conceit* which throws so much of pain into many an Artist's life may now be undermined. He who is an Artist, and is troubled because other men are so dead, and dull, and earthy, is tormenting himself with bugbears, confounding the Art-World with the real,—he is foolish; and if he have pain thereby it is a false pain, a pain gratuitously, unnecessarily incurred, although unfortunately, none the less on that account severe. Your grumbler is a grumbler because he forms a misconception of the world.

But the Artist need not be *always* in the clouds. There are many who are so—Dreamers; but there are many who are not so. They value Art as supreme in the Art-World, but subordinate in the real world; and thus they are right, just as our Beefeater and our Dreamer were right, because they preserve *unity* in their estimate of the world. The Alderman had no Art-World; the Dreamer no Common-sense World; our new Artist inhabits both the one and the other—but he keeps them separate. And certainly it happens, in our age at least, that Artists generally are alive to both the Art-World and that which I have called the Common-sense World—the World of Ambition, Fame, solid comfort, and wives and children. I do not counsel the Dreamer not to bring his Art into the real world, for he never comes down to it. Nor do I counsel Beefeater to leave his pelf below; for he never ascends, worthy man! he would explode if he got into so rarified a medium. But I counsel him who would live in both Worlds, that he properly contradistinguish the one and the other. The error of the man who, in his foolish conceit (how common it is!) gives his soul incessant trouble through his estimate of Art lies, not in giving antagonists their due, but in confounding them together in a hybrid. Kilkenny cats must be kept asunder.

Now, Sir, all this may seem insufferably dull and metaphysical. Forgive me for once, and I won't do it again (if I can help it). But surely it cannot be useless to the true Artist, to shew him that the standard is not a real one by which he is advised to put genius under bands and bars, and shun all "dreamy notions" as mere foolishness; to show him how it is—and how, justly,—that his soul refuses to be cramped by *prudence*-rules of common sense, although he cannot contradict their seeming value; to expose to him the reason why he so rebels instinctively against the maxims which he instinctively allows; and surely it cannot be useless either to put a beacon on the rock which has wrecked so many, to show him who is in danger the way he may avoid the evil thing which has so fatally crept in to blast the happiness and sour the spirit of many, many a brother. Men speak of artists as monomaniacs. They are not *necessarily* so.

Sir, these sketches of mine may seem disjointed and unfinished. They are partly so by necessity, being hasty; and partly purposely so, that I may not merely think for others, but lead others to think for themselves. The old lady to whom the wag lent the dictionary to read, is said to have reported that she had read the book through, and doubtless it was a good and a sensible book, but there seemed to be a sad want of connection in it. Nevertheless I hold it as certain, that the good dame had much advanced, albeit unconsciously, in the knowledge of the subject-matter: for every thing has its effect; and, depend upon it, she did not read the dictionary without its leaving an impression. Just so let it be with this: every idea, however isolated, is the offspring of a certain *system of thought*, a *ruling notion;* and it is that system of thought, that notion, in the abstract, which I would fain convey.

London. R.

STAINED GLASS, ST. JAMES'S CHURCH.

SIR,—In this, my reply to Mr. Mayhew's letter of the 28th instant, I will occupy your valuable space as briefly as possible. The question in my mind is of much more importance than will at first superficially seem to the many. It is therefore made to appear, that my former letter was intended as personal, than which nothing could be further from my intention. My object is truth and consistency in art, and had the window in question have been of a character in unison with the church, not one word would you have heard from me upon the subject.

London especially abounds with Italian churches of the class of St. James's, and this window is a most dangerous example, and which must give a tone to, and influence the designs of other artists in connection with them, sanctioned, as it is presumed to be, by fifty noblemen and gentlemen, unless as publicly protested against as an example. What a position, therefore, does this inconsiderateness place artists in, whose individual voices would be as nothing against such an undisturbed authority.

Sir, this is not a question between A and B or A and C; it is a question of public taste and propriety in the decoration of our Italian buildings; a question, in short, of whether these buildings are to be rendered into Gothic—and it is simply for this reason that I have pronounced this work a solecism and a discrepancy, although I could have wished that the task had fallen into other hands.

Nevertheless, however I may have been misunderstood to the contrary, I do not hold the artist blameable for this mistake, for he plainly and candidly stated at the outset thus, "having devoted himself and his workmen exclusively to the production of glass adapted to gothic structures, he hardly considered himself a proper person to execute a window for a church in the modern (meaning St. James's) style," from which I have a right to infer, that in *his* statement which follows, *he* was conscious of the doubtful propriety of advising Norman, excepting from the impracticability of any other, which assumption is an error. Mr.

Mayhew states, that "if first-rate talent be not employed on a picture, whether on glass or canvas, it generally raises a feeling of regret at the labour in vain." Perfectly true; but *why* should first-rate talent *not* be so employed? It is. As for the iron work and the lead spoken of, suffice it for me to say, that it is an erroneous notion. Not a lead or an iron line need be observable in an entire window; nor will the statements respecting the non-practicability of applying the art to pictorial purposes be long a *problem*, although Mr. Mayhew has said, that wiser heads have said nay. I do, however, most sincerely congratulate him upon his correct taste; for he plainly states, that he *prefers* the "truly pictorial," which, in fact, involves the whole question, and admits the justice of my strictures upon the work. His doubts, from his non-practice, may be excused; his wishes, that the art may improve equivalent to them, all must be obliged to him for.

The last part of Mr. Mayhew's letter I beg to make him a present of. Again stating, that a love of consistency and propriety in art, a love of justice, devoid of any personal feeling individually, has induced me to address you, Sir, on this subject, knowing full well from experience that this one work, sanctioned and dictated as it is by such eminent persons, must inevitably lead to other and grosser mistakes in art in general, if not arrested by some one; and with this sole impression I have been induced to raise my voice against it, regardless of whom I might unfortunately differ from, fully conscious that, however unpalateable the truth may be, it ought at all times to be told, and which must and will eventually prevail.

I am, Sir, &c., WILLIAM WARRINGTON.
42, Berkeley-street West, Hyde Park-square.

New Books.

NEUMANN, M. (director of the conservatories of the Museum of Natural History, Paris), *Theory and Practice on the laying out and building Conservatories of every kind—such as Houses for Orchideous and Water Plants, &c.* Translated from the French into German, with many additions, by F. B. BIEDENFELD. Weimar, gr. 4to., with forty plates.

AUDAT, M.—*Thermosyphon; or, the Water-Oven for heating all kinds of Conservatories, Churches, Theatres, Halls, &c.* Translated from the French, with additions, by F. B. BIEDENFELD. Ibid., gr. 4to., with twenty-one plates.

IN these works the architect will find much instruction on the building and heating of conservatories. In the first chapter the author speaks of conservatories in general, their form, the mode of supplying them with water, &c. At the end of every division of the work, treating of the different sorts of conservatories, a list of the plants is mentioned, which may be reared in this particular construction. An interesting part of the work is the description of the different important conservatories of France, Germany, and England, the construction of which is illustrated by plans and elevations.

The second work begins with a theoretical disquisition on heat, its radiation, &c. This is followed by a description of the various heating apparatus, as well as of hearths, flues, &c. Amongst the various heating apparatus, those of Rumford, Désarnod, and Curendeau are especially explained. The second part treats of the *caloriféres* with a current of air, whereby not only calefaction but a renewal of air is effected, as is the case in theatres, hospitals, &c. Two classes of *caloriféres* are adverted to; in the one, the fresh air rushes through channels into the hearth and the smoke flue; in the other, the smoke channels circulate through the air chambers. Many inconveniences are connected with those heating apparatus, especially unpleasant is the dry air of the *caloriféres*, still, this can be obviated by placing a flat, cast-iron recipient in the heat chambers—the great waste of fuel, however, prevents the use of that sort of *caloriféres*. The Palais de Luxembourg, at Paris, is heated in that way.

In the third chapter the author passes to the heating apparatus, with hot water circulation, which he calls *Thermosyphon*. Mr. Audat goes so far back as the Romans, and mentions the baths and sweating-chambers of Caracalla, Diocletian, and Titus, of which Vitruvius says, that they contained apparatus for conducting hot water in the reservoirs—a means which had not been rationally and scientifically carried out but at the latter part of the last century. The author states the following to be the advantages of the Thermosyphon: The heating with warm water at a low pressure is much more easy and economical than the heating by steam, as it does not require any supplying apparatus, no cleansing of boilers, &c. It is not so much impaired by tear and wear, and the great mass of water employed occasions a great uniformity of warmth, which continues even for some time after the going out of the fire. On the other side, the author does not dissimulate the drawbacks of this method, viz. the greater surface of warming apparatus required, the greater weight of the tubes, which encumber and may injure buildings. In the fifth chapter we find observations on the choice and the combination of tubes for the heating with warm water, the demonstration of the necessity of ventilation, as well as an easy method of calculating the celerity of air in a heating apparatus, and the quantity which can pass in a given time through a given space.

Correspondence.

ARE ARCHITECTS ONLY TO COPY?

SIR,—In answer to your correspondent, who evidently does not think with me, at least not with respect to the most material point of all, I would remark that if he has read my book, he has quite misconceived the spirit of it, for although it reprobates the practice of *mere copying*, a practice which puts all talent upon the same level, it earnestly inculcates not the desirableness only, but the necessity for our *studying* the works of former ages, for the purpose of imbibing the genuine spirit of those styles which we take as models, but which the system of copying without understanding the originals, without the slightest real feeling for them, and without any regard to altered circumstances, or the circumstances of the particular case, renders only collections of so many patterns for us now to work by, because we are, or choose to appear incapable of generating any fresh ideas of our own. Your correspondent R, "great R," as "Budownik" calls him, will, I think, agree with me in my views of the matter, also "Budownik" himself, and I hope I may add yourself likewise, if it be only to make up a trio, or if you like it better, a triumvirate.—I am, Sir, &c.,

E. B. LAMB.

26, Charlotte-street, Portland-place.
29th July, 1846.

NOTICES OF CONTRACTS.

[We are compelled, by the interference of the Stamp Office, to omit the names of the parties to whom tenders, &c. are to be addressed. For the convenience of our readers, however, they are entered in a book, and may be seen on application at the office of "The Builder," 2, York-street, Covent Garden.]

For building sewers in Moseley-street, Dean-street, Upper Dean-street, Pershore-street, to Dudley-street, and other places contiguous thereto in Birmingham.

For building a sewer in Ferry-road and Alfred-street, Poplar.

For the letting of extensive building or engineering premises in a central part of London.

For the execution of the Melton contract of the Syston and Peterborough extension of the Midland Railway, extending to a length of 9 miles 63 chains, and comprising the earthwork, bridging a tunnel of 900 yards, and all other necessary works for a double line of railway, with all materials, excepting rails, chairs, and sleepers.

For the disposal of the lease and fixtures of an oil and colour shop in one of the leading thoroughfares of London.

For the letting of a long-established house of business for a furnishing ironmonger, cutler, &c., in a good thoroughfare in town.

For the re-erection of Aiken Knowles bridge, in the West Derby Hundred.

For the sale of the business of the Britannia Foundry at Atherstone, with stock in trade, implements, &c.

For the various works required in the erection of a workhouse, with infirmary, receiving and vagrant wards, register offices, workasheds, and other buildings, for the Bridlington Poor-Law Union (extension of time).

For a supply of 80 fathoms of yellow deal ends and boards of the best description, for firewood, for the trustees of the parish of Islington.

For the disposal of an old-established ironmongers' business, a few miles out of town, with stock, fixtures, &c.

For a supply of 50 iron lamp-posts and columns, for the trustees of Islington parish.

For a valuation of the parish of Burton Mills, for the Mildenhall Poor-Law Union.

For lighting a part of the Hampstead Trust with naphtha, or essential oil of tar, or other spirit lamp, for seven months, and for furnishing and repairing York square or patent lamps.

For making a cylindrical sewer at Cambridge.

For the works necessary in extending the sewer from Butcher-row, along White Horse-street and Salmon's-lane—a length of 1600 feet, in the hamlet of Radcliff.

For the disposal of a long-established general ironmonger's business, in a good market town, 60 miles from London.

For the disposal, at a very low price, of a ready made pulpit, nearly new, with sounding-board and staircase complete, at Soho-hill.

For the erection of a rectory-house and offices, near Eye, Suffolk.

For the letting of the Kingston new steam saw-mills, at Hull.

For the mason-work to be done in the erection of public baths, at Rotherham.

For the carpenter-work to be done in the erection of the baths, at Rotherham.

For the iron and lead work to be done in the erection of the Rotherham Baths.

For the slater and other work to be done in the erection of the Rotherham baths.

For the disposal of a large quantity of larch and Scots timber trees, for railway sleepers and fences, near Castle Rising.

For the disposal of a quantity of oak, ash, and elm timber, near East Dereham.

For the execution of the Thirsk contract of the Leeds and Thirsk Railway with a branch to the Great North of England line, a length of about eleven miles.

For the disposal of a very large and rich surface deposit or lode of iron ore, and also of a rich vein of oxide, on 7 acres of land in Devonshire.

For the disposal at very reduced prices, of forty marble chimney-pieces, two wrought-iron gate piers 16 feet high, four freestone columns 6 feet 6 inches high, &c., at Gloucester.

For the construction of a railway tunnel and works for the London and North Western Railway at Liverpool, including a bridge over the railway.

For the letting or sale of the newly-erected iron foundry and steam-engine factory at Tividale, near Dudley.

For the disposal of a small ironmongery business in one of the best thoroughfares in Birmingham; stock about 150*l*.

For the repairs of the Presbyterian Church, at Stafford.

For works to be done in repairing, restoring, and improving the parish church of Ilfeld.

For the execution of the works of the General Terminus and Glasgow Harbour Railway (extension of time).

For the execution of the whole of the works on that part of the Aberdeen Railway from Redhall to Laurence Kirk—a length of about 3½ miles.

For the execution of the whole of the works on that part of the Aberdeen Railway from Laurence Kirk to the river North Esk—a length of about 4 miles.

For the execution of a branch railway on the Glasgow, Paisley, Kilmarnock, and Ayr line—a length of about 5½ miles.

For the sale of the bankrupt stock of a furnishing ironmonger, with shop fittings and tools (extension of time).

For the execution of the Newport Extension of the Edinburgh and Northern Railway, between Cupar and Leuchars, in two divisions.

For taking down and rebuilding the bridge at Stockwell, Glasgow.

For a supply of 100 to 150 yards of second hand cast-iron pipes, 12 to 15 inches in diameter, and say 5-8ths inch thick; also for a good borer to sink for coal.

For the disposal of a large quantity of Scots fir sleepers at the Moray firth.

For the letting of a going lime-work in Scotland.

For the letting of a slate-quarry at Appin, Scotland.

For the disposal of cargoes of 500 to 1,000 square yards of Caithness flag-stones with sawn edges, natural faces, &c.

For supplying her Majesty's dock-yards with oils.

For the disposal of a hall staircase and fittings of oak and mahogany, at Chancery-lane.

For the erection of schools adjoining Walton church-yard (Liverpool).

COMPETITION.

Plans and estimates are wanted for the rebuilding of the parish church of Holyrhood, Southampton.

APPROACHING SALES OF WOOD, &c.

BY AUCTION.

At Hull: a large quantity of timber and deals, in suitable lots, with deal ends, lathwood, &c.

At Croxton Park: 963 oaks and 56 willows.

At West End, Southampton: 130,000 red bricks, in lots.

At Wimbledon Common: about 200 loads of fir, and 100 loads beech timber, in 6-inch quartering and sleepers, well seasoned, and in lots.

At Birmingham: a large assortment of paper-hangings of the newest patterns.

At Birmingham: an extensive rolling-mill, with engines, boilers, saws, &c.

At Galleywood Common: a builders' or cabinet makers' workshop, timber shed, timber, planks, &c.

At Vine-street, Minories: 14 marble chimney-pieces, a lead cistern, brick cart, &c.

At Brentford Bridge: a collection of lathes and tools of every description, for working iron, slate, and wood.

At Manchester: the Chapel-street Iron and Brass Foundry.

At Charlton-upon-Medlock, Manchester: the contents of a machine shop, comprising lathes, planing-machines, &c.

At Manchester: the contents of a tool manufactory, comprising stock in trade, implements, utensils, tools, &c.

At the Sands, Leith, 23,000 feet yellow pine and 230 deals.

At the docks, Leith, 6,400 feet birch, 500 feet hard-wood planks, and 250 feet pine plank.

At Assembly-street, Leith, 2,200 deals and 2,500 battens.

At Liverpool, 1,245 logs, pencil cedar; 4,944 boards, oak wainscoting; 30 logs, Havannah cedar; 300 planks, Honduras mahogany; 1,474 lancewood spars, &c.

At Liverpool, 915 logs and cuts of St. Domingo mahogany.

At Liverpool, 847 logs, St. Domingo mahogany.

At Belfast, a quantity of white oak, rock elm, and red and white pine.

TO CORRESPONDENTS.

"A Constant Reader."—We may make use of the communication, though we cannot print it. We shall give attention to the subject.

"One Under the Operation of the Act."—The same.

"P. X."—We are unable to reply without a specimen.

"St. James's Church Window."—The number of letters received on this subject is so large, as to preclude the publication of them, even if they presented any new points.

"Builders' Tender."—On this subject too, a flock of letters have been received. They shall all be considered. Some would subject us to an action for libel.

A Correspondent wishes to know the name of the builder of the church at Mount St. Mary's, near Bariborough, Derbyshire.

Received.—"J. A. F.," "Budownik," "J. S.," "J. D.," "An admirer of the Works of Wren," "Regular Subscriber," "Country Subscriber."

ADVERTISEMENTS.

ROYAL POLYTECHNIC INSTITUTION.—A Chemical Lecture, by Dr. Ryan, daily, and on the Evenings of Mondays, Wednesdays, and Fridays, Prof. Bachhoffner's Lectures on Natural Philosophy, with brilliant experiments, daily. Macintoshe's Revolving Engine, Coleman's Patent Locomotive Engine for ascending and descending inclined planes, Farrell's Archimedean Railway, the Atmospheric Railway, all in action. Hallette's Atmospheric Railway Valve. Clark, M'Neill, and Co.'s Patent Universal Gas-Burner. The Opaque Microscope. The Oxy-hydrogen Microscope, exhibiting a fine Collection of Living Objects. A beautiful Picture of the Chapel in the Convent of St. Catherine, near Jerusalem, by Mr. Charles Smith, is one of the series of Dissolving Views.—Admission, 1s.; Schools, Half-price.

NOTICE TO INVENTORS.

OFFICE for PATENTS of INVENTIONS and REGISTRATIONS of DESIGNS, 14, LINCOLN'S-INN-FIELDS.—The printed Instructions gratis, and every information upon the subject of PROTECTION for INVENTIONS, either by Letters Patent or the Designs Act, may be had by applying personally, or by letter (prepaid) to Mr. Alexander Prince, at the office, 14, Lincoln's-inn-fields. Where may be had, price 12s., or, through any bookseller in the United Kingdom, of Wm. BENNING and Co., law booksellers, 43, Fleet-street, the LAW of PATENTS and REGISTRATIONS, with all Forms and Cases up to the present time, by SIDNEY BILLING, Esq., barrister-at-law, and ALEXANDER PRINCE, of the Office for Patents, 14, Lincoln's-inn-fields.

MORTGAGE AND ANNUITY OFFICE, No. 123, CHANCERY-LANE.

PERSONS requiring LOANS by way of MORTGAGE or otherwise upon any available security, may at all times procure an advance to the extent of from 100*l.* to 150,000*l.*, or so much as the property will bear, by applying to Mr. BRAY, surveyor, at the offices as above, where a registry for the sale of estates, houses, land, life interests, and reversions, is kept for inspection.

N.B. To expedite the procuration, personal application at the office would in all cases be better, the party bringing with them the abstract of title, plans, &c.

FRENCH PAPER-HANGINGS.—The Trade are respectfully informed, that at the Depôt of Messrs. MARKS and CO. is concentrated a most extensive stock, with weekly additional consignments, all the newest and most elegant patterns in Piece Paper and Decorations, at Parisian prices, with the reduced duty of 2d. per yard.—59, Princes-street, Leicester-square. Established 1834.

TO PAPER-HANGERS, HOUSE-DECORATORS, BUILDERS, SHIPPERS, &c.

JOHN TODD MERRICK & Co., having removed to their new Manufactory in New Oxford-street, take the opportunity of soliciting the inspection of the Trade to their extensive stock of paper-hangings, comprising every variety, from the cheapest to the most costly and elegant drawing-room patterns. They also invite attention to their complete assortment of panelled decorations, suitable for every description of room; and beg to announce that they are now ready to receive orders, furnish estimates, and enter into contracts in any situation, and to guarantee the execution of them in the first style.

J. T. M. and Co. beg to state, that they will execute any French pattern that may be brought to them, fully equal in quality, at the same price that it can be purchased in Paris, thereby effecting a saving of the duty and carriage to the purchaser. They are, however, constantly receiving importations of the newest designs, having entered into an arrangement with an important Paris house for their regular supply.

TO ARCHITECTS, BUILDERS, &c.

GAS LAMPS, GAS BRACKETS, GAS PILLARS, BURNERS, &c. &c. In calling the attention of architects, builders, &c., to their assortment of Gas Furniture in general, C. DEBAUFER and SON respectfully announce they continue to fit up premises of every description on the most approved and newest system of gas fitting. An experience of forty years justifies us in making the above assertion.—P.S. Country orders attended to with dispatch.

10 and 11, Creed-lane, St. Paul's.

FIRE-PROOF SAFE MANUFACTORY,

LEADBEATER,

125, Aldersgate-street, City Nine Years Sole Manufacturer for Chubb, St. Paul's Church Yard, has on sale a large assortment of fire-proof book-safes and chests; wrought-iron fire-proof doors for strong rooms; fire-proof jewel cases, cash, and deed boxes; fire-proof plate-chests, &c., &c., all secured by LEADBEATER'S IMPROVED DETECTOR LOCKS, throwing from three to twenty bolts, at prices 20 per cent. under any other house in London. All the above-named fire-proof articles, manufactured in the best manner, afford perfect security against fire and thieves.

LEADBEATER'S IMPROVED DETECTOR LOCKS for universal purposes, afford perfect security against false keys and pick-locks. Sold at prices equally reduced.

TO BUILDERS, PAINTERS, DECORATORS, AND OTHERS.

MESSRS. WOOD AND COMPANY, Grainers and Writers to the Trade only, by contract, measure, or otherwise.

62, Waterloo Bridge-road. All letters post paid.

N.B. Workmen sent to any part of the kingdom.

*** An Apprentice wanted.

TO BUILDERS, PAINTERS, &c.

C. WILLIAMS, 13, Palace-row, New-road, Imitator of Woods and Marbles, respectfully informs the Building Trade generally, that for the last five years he has been in the employ of Mr. W. HAMMOND, and begs now to solicit the favour of their patronage, trusting that by strict attention and moderate terms he shall secure their future favours.

N.B. Country orders attended to with punctuality.

WALLIS'S PATENT LIQUID WOOD KNOTTING.—This newly-discovered Liquid Composition which Messrs. Geo. and Thos. Wallis have the satisfaction of introducing to the trade, possesses the important qualification of effectually stopping Knots in Wood, however bad, and preventing them eating through and disfiguring the paint above.

Many substances have been used and much time spent in endeavouring to find a cure for a bad Knot, but hitherto without success. Messrs. Wallis therefore feel much pleasure in offering to the public an article so long and anxiously called for.

In the application, skill is not required; it is put on to the work with a brush like common paint, can be used in all climates and situations, and does not require heat.

Sold wholesale and retail, by Messrs. G. and T. Wallis, Varnish, Japan, and Colour Manufacturers, No. 64, Long Acre. Price 16s. per gallon.

DAY'S PATENT WINDGUARD, for ventilating

Churches,	Shops,	Kitchens,
Hospitals,	Bed-rooms,	Offices,
Factories,	Smoking-rooms,	Ships,
Theatres,	School-rooms,	Mines,
Breweries,	Nurseries,	Vaults,
Malt-houses,	Stables,	Tunnels,
Club-houses,	Larders,	&c. &c.

Also for preventing down draft; and is guaranteed to cure all smoky chimneys caused by wind; and entirely supersedes the use of revolving cowls, or any thing moveable or unsightly on the tops of chimneys or ventilators.

The object of this invention is to create a draft where otherwise it would not exist, by the spontaneous action of the external air. The Windguard forms a pleasing octagonal pillar, and by its peculiar construction to carry out the principle on which it is based, which consists of the wind giving a disposition for a vacuum within, thereby causing a continual upward current about equal to the velocity of the wind at the time acting upon it, which averages about six feet per second thirty days out of thirty-one; therefore, will nearly at all times ensure a continual change of air, being no impediment to spontaneous ventilation, even on a perfectly calm day. One five feet square will ventilate a building containing upwards of 1,000 persons. The Windguard applied to ships and steam vessels, in the form of a sky-light, prevents rain or the sea entering within, however boisterous the weather may be, thereby affording excellent ventilation as well as light. The Windguard is simply applied for effectually ventilating bed-rooms, nurseries, smoking-rooms, offices, &c., causing the air of the apartment to be at all times as pleasant as can be desired. It is fixed at the top of the chimney, in addition to which a cast-iron frame and valve (about one foot area), made to open or shut at pleasure, is let into the flue, near the ceiling of the room, to allow the constant ascending vitiated air being immediately carried off. The opening is guarded by a neat venetian blind or grating; and so powerful is the effect on a windy day that if a handkerchief be thrown up to the grating, it will remain there—i. e. if the valve be open. In winter the valve would be only partially open, to allow the smoke from the fire to ascend, but if the room be found too cold, can be entirely closed. The Windguard applied to the tops of chimneys prevents all annoyance from smoke (caused by wind); indeed, where it does not, nothing else applied at top will (of the same size); care, therefore should be taken to have the proper size applied. It is simple in its application, reasonable in price, ornamental in appearance; no machinery or anything moveable in it, therefore, cannot get out of order; free from noise or any unpleasantness whatever; not liable to choke up with soot; no obstacle to the machines used for sweeping chimneys. May be had of all respectable ironmongers in town and country; and may be seen daily in operation, where its powers and usefulness are exhibited by the severest tests, at THE PATENT VENTILATING WORKS, COMMERCIAL-ROAD, PIMLICO, LONDON; where also may be seen Mr. G. T. Day's plans (illustrating the different applications of his Patent Archimedian Ventilator and his Portable Water Apparatus) for effectually Ventilating, Warming, and Cooling the Air of Buildings, Ships, Mines, &c. &c. By the use of these inventions many thousand cubic feet, or any quantity of pure warm or cold air, can be guaranteed to be continually exchanged per minute, day and night, winter and summer; thereby insuring, at all times, free ventilation to the rooms and passages of buildings, &c. from the basement to the roof, at the same time in such a manner as shall not be inconveniently perceptible. The size of the apparatus depends on the nature and use of the building and its occupants. The Patentee has been honoured by his inventions being applied at the following places:—

Windsor Castle,	Trinity House,
Buckingham Palace,	Ordnance,
Saint James's Palace,	Greenwich Hospital,
Claremont Palace,	Christ's Hospital,
Walmer Castle	Westminster Hospital,
The Houses of Parliament,	Bethlehem Hospital,
New Conservative Club,	Surrey Lunatic Asylum,
White's Club,	New Royal Exchange,
Travellers' Club,	Mansion House,
Oxford and Cambridge,	Goldsmiths' Hall,
Parthenon,	Fishmongers' Hall,
Wyndham,	Haberdashers' Hall,
Army and Navy,	Dyers' Hall,
Senior United Service,	Grocers' Hall,
Junior United Service,	Armourers' Hall.
Admiralty,	Weigh-house Meeting-house
British Museum,	Hanover Square Rooms,
Somerset House,	Theatre of the Westminster
Custom House,	Literary and Scientific Institution,
Mint,	Grand Cigar Divan, Strand,
Hon. Artillery Company,	City Club,
H. M. S. Salamander,	

And many other Public Buildings in Town and Country, as well as to the Mansions of many Noblemen and Gentlemen. Licenses granted for Manufacturing the above.

Drawings and Plans made for Ventilating and Warming Buildings of every description.

TO CIVIL ENGINEERS, SURVEYORS, &c.

HENRY POPE, Wholesale Stationer, desires to return his best thanks to the Profession for their support, which has secured to him so large a sale of his mounted drawing papers, and from which he has made arrangements to keep a large stock always on hand, as well as tracing, drawing-papers, and every description of general stationery, which may be had at the wholesale prices.

N.B. Maker of the Metallic, Levelling, and Surveying Field Books, with Patent Pencil. 22, Budge-row, Watling-street, City.

CHEAP PAN FOR WATER CLOSETS, With Trap, in one Piece.

DOULTON and WATTS, Lambeth Pottery, London, Manufacturers of the above in superior glazed STONE WARE, price 7s. 6d. each. They are of the most durable ware, and are recommended in preference to iron on account of their cleanliness and cheapness. If preferred, they can be had in two parts, the pan at 4s. 6d., and the Trap at 3s. 6d. N.B. Manufacturers of RAIN WATER PIPING for houses.

SNOXELL'S PATENT SAFETY REVOLVING WOOD SHUTTERS,

Manufactory, 96, Regent-street, and 131, Chancery-lane.

THE Patentee can confidently recommend these Shutters both for security and durability. The edges being sheathed with IRON, and the cost little more than common shutters, their construction so simple, that the largest establishment can be opened or closed in a few moments with the greatest possible ease without the use of machinery. Their superiority over other Revolving Shutters consists in being made without metal hinges, consequently cannot rust, buckle, or get out of order, and are equally safe. W. SNOXELL will have much pleasure in giving reference to numerous establishments where they are fixed, having on all occasions given the greatest satisfaction.

REDUCTION IN THE PRICE OF

BUNNETT AND CORPE'S

PATENT REVOLVING IRON SHUTTERS.

THE validity of this Patent being completely established, the Patentees have much pleasure in stating that the very extensive demand, and the employment of improved machinery in the manufacture, have given them an opportunity (of which they gratefully avail themselves) of making a considerable reduction in the price of this well-known and tried invention, thereby rendering them the cheapest as well as the best iron shutters in use. Every improvement suggested by practical skill and most extensive application has been adopted, and no effective REVOLVING IRON SHUTTER can be constructed without infringing B. and C.'s patent. The worm and wheel, as patented by them, being the only safe, durable, and efficient mode of raising and lowering such shutters, these shutters can be applied horizontally, either above or below the window, or vertically, as introduced by BUNNETT and CORPE, in some of the largest establishments: they are made with bent or corrugated laths, if required.

BUNNETT and CORPE also manufacture

REVOLVING WOOD SHUTTERS,

with their patent raising machinery, or with counterbalance weights, and with proper metallic hinges, without which no shutters can be safe or durable.

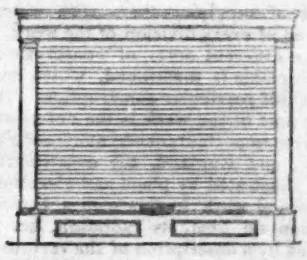
BUNNETT and CORPE are likewise Patentees and Manufacturers of METALLIC SASH-BARS, MOULDINGS, &c., IN BRASS, COPPER, OR ZINC, FOR SHOP FRONTS, WINDOWS, SKYLIGHTS, AND VARIOUS OTHER PURPOSES.

Shop Fronts fitted in a superior manner with Iron Shutters, Patent Brass or Zinc Sashes, Moulded Engraved Stall Board Plates, best Plate Glass, and internal Brass Fittings of all kinds, on the most advantageous terms. Estimates given and contracts taken in Town or Country.—All kinds of metal works executed to any design. Metal Drawing, Rolling, and Stamping for the Trade. OFFICE, 26, LOMBARD-STREET, LONDON. WORKS, at DEPTFORD, KENT.

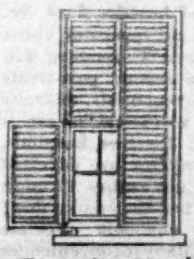
IMPROVED PATENT CONVEX IRON REVOLVING SAFETY SHUTTERS.

PATENT SAFETY IRON SLIDING SHUTTERS.

PATENT REVOLVING PERFORATED BLINDS.



PATENT OPENING SHUTTER AND CASEMENT CONCEALED SLIDING BLINDS.



The attention of Architects, Builders, Blind Makers, and the Trade generally, is particularly requested to the IMPORTANT patented IMPROVEMENTS in the above enumerated Articles, and inspection invited, at the Manufactory of the Patentees, R. HOWARD and Co., 115, Old Street, London; or at the Licensees.

Engravings and Prospectuses may be had at the above address, or will be forwarded on application.

The great importance of STRENGTH and STIFFNESS in the Laths of REVOLVING IRON SHUTTERS, when required for SECURITY, is so obvious, that it is only necessary to point out the fact that the PATENT CONVEX LATHS ARE 12 TIMES STRONGER THAN THE ORDINARY FLAT LATHS (as shewn by the engravings and prospectus), to ensure their general adoption.

REVOLVING IRON SHUTTERS MADE OF THE COMMON FLAT LATHS, AT A VERY CONSIDERABLE REDUCTION OF PRICE.

CAUTION.—The Patentees beg to caution all persons against Making or Using BENT LATHS for REVOLVING IRON SAFETY SHUTTERS, so as to obtain increased strength or stiffness; as they thereby render themselves liable to legal proceedings for infringing this patent.

Licenses Granted.